

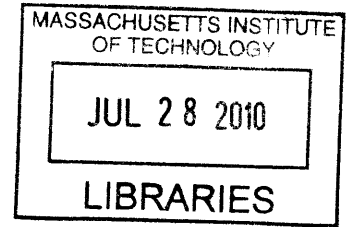
Suggested Strategies and Best Practices in Private Supply Chain Disaster Response

by

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Abstract

In times of disaster, demand for goods and services in affected areas spikes. Private companies generally have contingencies in place for business continuity; however, most lack a strategic approach to join the general population's relief efforts. Why are some companies more effective within disaster relief supply chains than others? How can a company approach this area of opportunity? This thesis explores what a disaster is and how disaster management works; recognizing what stakeholders participate during disaster recovery efforts; and extrapolating best practices applied during past disasters by companies that have been deemed successful. Based on the strategies identified during our research, we came up with a framework of nine best practices and suggest how to apply it across a range of ten industries.

Dedication

For Apichart.

Biographical Note

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1 Introduction

In times of disaster, natural or man-made, demand for goods and services in the affected areas spikes up creating an opportunity for private companies to join the relief effort. However, disasters usually compromise the transportation and logistical ecosystems of the affected areas creating chaotic circumstances with decentralized and often disorganized decision making. Despite their best intentions, private companies are often not able to provide their goods or services in the most effective manner. Some large companies, however, have processes and command structures in place to operate through these challenges and provide relief to the affected areas. This thesis explores strategies employed during disaster relief efforts and extrapolates them into a set of best practices that other companies can follow.

1.1 Motivation for this thesis

The motivation for this problem comes from private companies' desire to provide goods and services during times of disaster. A disaster response trends paper from INSEAD states that companies wish to provide aid for many reasons some of which are: improving reputation, raising the level of employee satisfaction and improving the attractiveness of the company to prospective employees (Van Wassenhove, Stapleton, & Tomasini, 2006). Additionally, it states that the trend is moving away from simply providing cash donations to corporate-humanitarian partnerships that include the transfer of expertise which can be a great source of cross-learning for both sectors (Van Wassenhove, Stapleton, & Tomasini, 2006). Most large companies have contingency plans for disruptions in their own supply chains. The traditional aim of these plans is to establish a chain of command and provide goods or services to the affected installations in

the most effective manner. The same mindset applied to disaster relief can limit the loss of life and end suffering for those affected sooner. Most companies believe that doing so will positively improve their brand and customer loyalty but even beyond that some believe that it is their obligation to do the right thing when their customer's communities are affected.

Further, Tatham and Kovács recognize the need for a framework in which the multiple stakeholders (private companies included) can respond to disasters and minimize the need for ad hoc planning once a disaster has actually struck. They studied the 2005 Pakistan Earthquake in detail and noted that although the response to the earthquake was timely and well executed, pre-existing processes and relationships could have improved the process even more saving additional lives and making the recovery that much better (Tatham & Kovács, 2007).

1.2 Current situation of private companies' disaster response strategies

Currently, most companies have contingencies in place for continuing their own operations in case of a disruption. However, most lack a strategic approach to provide aid to disaster struck areas like some companies have been able to do in the past. Additionally, companies typically setup operations and relationships based on an as-needed basis during times of disasters. Most companies do not have long term relationships with aid agencies; this creates trust issues between the two parties and also leads to duplication of functions in many places (Van Wassenhove, Stapleton, & Tomasini, 2006). This thesis will limit the research scope to strategies employed during relief efforts in the continental United States. We feel that it will be much easier to extrapolate a functionally sound set of best practices from the United States than to broaden our scope at this point of time.

1.3 Literature review

Our survey of the literature started with an exploration of disasters in the United States, their impact on human life and the associated costs. Further we explored stages of the disasters, the stakeholders in the process and the disaster management cycle. After gaining a better understanding of the process, we shifted our focus to researching corporate responses to disasters, current trends in corporate response and lessons learned from the military's responses efforts around the world. Finally, we focused our energies on researching private companies that are recognized for their efforts during disaster response by researching news articles and academic papers.

Our research on companies recognized for their efforts during disaster response immediately led us to Home Depot and Wal-Mart. Both companies provided disaster relief during hurricane Katrina and were lauded for their efforts both by the media and academicians (Horwitz, Wal-mart to the rescue, 2009). We explored the strategies employed by these companies to find commonalities and later use these commonalities to suggest a basic framework of best practices on how private companies should approach humanitarian disaster response.

1.3.1 What is a disaster?

A disaster is defined as a serious disruption of the functioning of society, causing widespread human, material, or environmental losses that exceed the ability of affected society to cope using only its own resources (UNDHA, 1992). Natural disasters range from wildfires, hurricanes,

earthquakes, tornados and drought to infectious disease outbreaks. Man-made disasters can range from wars, accidents and terrorist attacks to oil spills. Thomas and Kopczak (2005) forecast that over the next 50 years, both natural and man-made disasters will increase five-fold. In order to appreciate the impact of a disaster, we explored the statistics on both natural and man-made disasters in the United States.

1.3.2 Statistics on natural disasters in the United States

According to the National Climatic Data Center (NCDC), an organization responsible for monitoring and assessing the Earth's climate, the U.S. sustained 58 weather-related disasters during the 1980-2003 period in which overall losses reached or exceeded \$1 billion dollars at the time of the event. In twenty of the past twenty-four years, the U.S. has experienced at least one weather-related billion-dollar disaster. Ross & Lott suggest that it is changes in society which is putting more people in harm's way than climatic fluctuations. For example, the general population growth in the US along with a rapid growth in U.S. coastal population places more people at risk when hurricanes make landfall. Further, Ross & Lott extrapolate by saying that the nation might soon experience \$50 Billion storms which ended up being true when Hurricane Katrina surpassed that number after making landfall in the Gulf coast area in 2005 (Ross & Lott, December 2003).

1.3.3 Hurricane Katrina (2005)

Considered the third strongest hurricane to ever hit the US shoreline, Hurricane Katrina was responsible for the loss of 1,800 lives in 2005. The storm was 100 miles from its center and was

considered a category 5 due to sustained wind speeds of over 175 mph. As of April 2006, the Bush administration had sought \$105 billion for repairs and reconstruction in the region. This does not account for damage to the economy caused by interruption of the oil supply and exports of commodities such as grain. The hurricane also put hundreds of thousands of local residents out of work which cost the economy billions of additional dollars on top of the damage costs (Facts About Katrina, 2006). Further, we explored man-made disasters to explore their impact.

1.3.4 Man-made disasters in the United States

Although the occurrence of man-made disasters in the US is less than natural disasters, the impacts can be significant. The Federal Emergency Management Agency categorizes all disasters and has three categories for man-made disasters: Chemical/Biological, Technological and Terrorism. There are a total of eight recorded incidents of chemical/biological disasters in the US which include water contamination in Rhode Island in 1992 and most recently the Kansas Grain Elevator Explosion in 1998. Technological disasters, eight of which are recorded, include power outages in Michigan, Ohio and New York on September 23, 2003. Lastly, the Terrorism category, which also has seven recorded events, includes the terrorist attacks on September 11, 2001 (Federal Disaster Declarations, 2010). Due to the high frequency of disasters, a system of managing the response becomes necessary and we explored this next in our review of the literature.

1.4 A definition of disaster management

The main purpose of disaster management is coordination of the various stakeholders to deliver aid to the affected population. The management process starts with planning/preparedness and matures into initial assessment of needs, resource mobilization, sourcing, logistics, asset tracking and ends with the rehabilitation period (Russell, 2005). The management process also coordinates the efforts of various stakeholders which include the aid recipients, humanitarian organizations, logistics providers, donors, the government and international agencies (Tatham & Kovács, 2007). The network of stakeholders during times of disasters morphs into a disaster relief supply chain similar operationally to a corporate supply chain but with a not for profit motive.

The key difference between a corporate supply chain and a disaster relief supply chain is that no formal relationships typically exist between the stakeholders of a disaster relief supply chain prior to the disaster. Often, the relationships that do form during relief operations cease to exist after the operations stop because every disaster is different and may require a completely different supply chain (Oloruntoba & Gray, 2006). The type of supply chain that forms during disaster relief depends on the stage of the disaster because the stakeholders involved in preparation are often different from those involved during reconstruction.

1.4.1 Recognized stages of disaster recovery

According to the National Response Framework, once immediate lifesaving activities are complete after a major disaster, the focus shifts to assisting individuals, households, critical infrastructure, and businesses in meeting basic needs and returning to self-sufficiency. The

framework considers only two phases: short term recovery and long-term recovery. Short term recovery includes the restoration of basic services and functions such as restoring transportation routes, re-establishing law and order, providing food and shelter to the displaced. Usually the short term recovery lasts only a few weeks. Long term recovery overlaps with the short term recovery efforts but may continue for years. It involves re-building damaged areas, providing new permanent housing and restoring the economy of the affected area (Disaster Recovery, 2008).

Most disasters, however, have stages that can be classified primarily into three categories: preparation, immediate response and reconstruction (Tatham & Kovács, 2007). The scope and duration of each stage depends on the type of disaster. Long lasting events can be generically differentiated from short term events (Kovács & Spens, 2007). Consequently, the duration of each phase of relief effort is dependent on the type of disaster. For example, reconstruction from a category five hurricane can take years of re-construction while a power outage may only take days.

Further, Carter classifies the disaster stages into prevention, mitigation, preparedness, disaster impact, response, recovery and development (Carter, 1991). He states that the length of each stage depends on the type of disaster and can vary considerably. He separates prevention from mitigation as to him, prevention means steps taken to avoid the disaster altogether while mitigation focuses on reducing the effects of disaster on the affected area (Carter, 1991). Some authors do not differentiate between the two steps.

Consolidating the two viewpoints, we can submerge Carter’s seven steps into Tatham & Kovács (2007) three-step model, creating a unified and robust framework like the one shown in Figure 1.

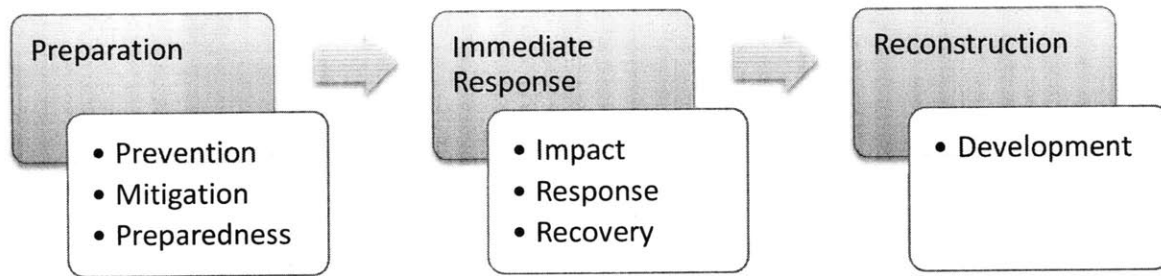


Figure 1: Stages in disaster management

1. Preparation

- a. Prevention – Action designed to impede the occurrence of a disaster event or prevent the effects of it to the community. Examples of this would be building a dam/levee to avoid floods or creating fire lanes to avoid the spread of forest fires (Carter, 1991).
- b. Mitigation – Actions designed to reduce the effect of the disaster on the community should it occur. Examples include building codes to make them earthquake resistant or developments in infrastructure such as making new highways away from disaster prone areas (Carter, 1991).
- c. Preparedness – Actions designed to facilitate a quick response from the government, communities or individuals involved in disaster response. Examples include evacuation plans for buildings or cities, dedicated emergency

communication lines or public education and awareness campaigns (Carter, 1991).

2. Immediate Response

- a. Disaster Impact – This is the assessment stage once a disaster strikes.
- b. Response – Actions taken immediately following the disaster. The main goal in this stage is to limit the loss of life and damage to property by taking mitigating actions. Main actions include search and rescue, providing food and water and assessment of damage and asking for help when required (Carter, 1991).
- c. Recovery – This process which may take many years depending on the scale of the disaster focuses on getting the affected community back to its proper functioning level. Steps involved include restoration of essential services, repairing buildings and homes and physical and psychological rehabilitation of the victims (Carter, 1991).

3. Reconstruction

- a. Development – This step takes a long term approach and provides a link between disaster-related activities and national development and policy making. It is included in the disaster cycle to ensure the takeaways from the disaster are reflected in future policy decisions. Examples include optimizing international aid, improving building codes and enhancing the response framework (Carter, 1991).

1.4.2 Roles that participate during disaster recovery

Disaster relief is a coordinated effort among multiple stakeholders such as the NGOs, local and federal government, logistics providers, donors, the military and private companies with the ultimate goal of providing relief to the affected population otherwise called the aid recipients. Each stakeholder comes from a different background, has a different set of problems and a different culture. As such, without proper coordination, clashes are inevitable (Tomasini, 2009). Stakeholders can generally be grouped into two categories: domestic players and international players. Domestic stakeholders include the local government, military, local companies and local aid agencies. International stakeholders include foreign governments, foreign companies, international agencies such as the UN and NGOs (Kovács & Spens, 2007).

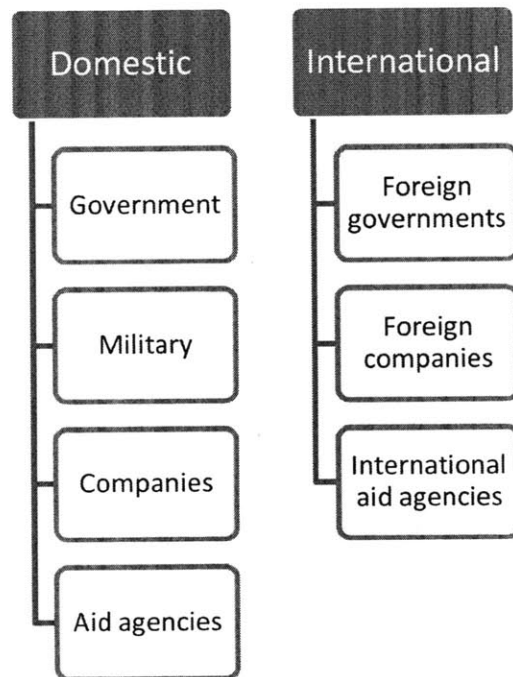


Figure 2: Participants during disaster recovery

Since the disaster relief supply chain is often setup on the spot with very little prior planning, it is very important to study the various stakeholders, the roles they play and the

cultures they come from to better understand disaster management and how private companies can help.

Aid recipients

Disaster relief's end result is to alleviate the death and suffering of the aid recipient with limited time and resources. Disasters affect the aid recipients with varying degrees. Those hurt, sick or deceased are considered victims (Russell, 2005). However, aid recipients who avoid physical harm may still be affected by various degrees of physical and mental stress, a feeling of loss and might be vulnerable to deterioration. Along with the basics necessities such as water, food and shelter, aid recipients often need to be re-united with their family members during times of disasters and often need long term support re-building their lives (Rebuilding Hope & Homes, 2006).

Non-governmental organizations (NGOs)

Although the first response is normally handled by the local players: local government and first responders; specialized international NGOs often arrive to the scene within one to three days and resume specialized relief activities. For example, in the 2005 Pakistan earthquake which took approximately 80,000 lives, the UK based International Rescue Corps (IRC) who specialize in search and rescue arrived on the scene and started work in less than 30 hours. This team continued to work for 4 days and they estimated that they had saved 75 lives (Tatham & Kovács, 2007).

NGOs are motivated by the desire to help without taking sides and are extremely good in dealing with ambiguous circumstances. As their primary goal is to provide aid, they don't fare particularly well with regards to efficiency or coordinating with other stakeholders.

Logistics providers

Logistics' primary job is defined as managing the flow of goods, information and finances from donors to affected persons (Kovács & Spens, 2007). The word 'logistics' comes literally from the medieval Latin 'logisticus' of calculation, from Greek 'logistikos', skilled in calculating, from 'logizesthai', to calculate, from 'logos', reckoning, reason (Van Wassenhove L. , 2006).

International logistics giants might get the relief supplies to the local airports. However, it then becomes the responsibility of the local NGOs to transfer those supplies to the disaster site.

Often times, small local logistical companies need to be brought onto the effort as they know the local landscape well and can deliver goods even with compromised road and bridge infrastructure (Tatham & Kovács, 2007). Van Wassenhove (2006) estimates that logistical costs account for 80% of the costs of any humanitarian operation.

Donors

Donors can be the government, corporations, foundations, individuals and charities that participate by donating funds to the relief effort. Donations can come in the form of money, materials and services (Van Wassenhove, Stapleton, & Tomasini, 2006). Although the majority of funding in any major disaster comes from organizations such as the World Bank, individuals and charities such as the Red Cross contribute significantly (Tatham & Kovács, 2007). Donors, if

un-coordinated can often create a bottleneck in the relief process by flooding the affected region with unnecessary good and supplies. For example, during the September 11 attacks, the city of New York received several truck loads of supplies from major US companies which were not required by the city. These trailers had to be removed from the streets of Manhattan and sent back to the donors during the relief effort which added to the burden (Specialist, 2010).

In recent report titled “Corporate Responses to Humanitarian Disasters”, the authors state that cash donations are still a favored option for the humanitarian options but it is not the only option. Recently, the number of corporate-humanitarian partnerships that include the transfer of expertise have been rising (Van Wassenhove, Stapleton, & Tomasini, 2006).

Government agencies

In the U.S., the state government has jurisdiction over the disasters that take place within its boundaries and may request federal help if needed (Homeland Security Directive: National Preparedness, 2008). After being requested by the governor of the state, the president may sign a disaster declaration that includes both Individual and Public Assistance programs (Wright, 2010). States that are often subject to disasters are more proactive in their disaster response operations and often have detailed contingency plans outlined on their websites. For example, the State of Florida has a site (floridadisaster.org) that serves as the home page for the state agency that liaisons with federal and local agencies on emergencies of all kinds.

The National Response Framework (NRF) presents the guiding principles that enable all response partners to prepare for and provide a unified national response to disasters and emergencies. It establishes a comprehensive, national, all-hazards approach to domestic

incident response. Further, the National Incident Management System (NIMS) complements the NRF by providing a comprehensive, national approach to incident management that is applicable at all jurisdictional levels and across functional disciplines (Homeland Security Directive: National Preparedness, 2008).

Military

The US military plays a key role in both domestic and international disasters. For example, the Army Corps of Engineers were responsible for de-flooding New Orleans after the storm surge from hurricane Katrina overwhelmed the levees (Hoar, 2006). The U.S. Coast Guard also played a key role in the planning, response, and recovery efforts during hurricane Katrina. Of the estimated 60,000 people that needed to be rescued from rooftops and flooded homes, Coast Guardsmen saved more than 33,500, including rescuing from peril 24,135 lives and evacuating 9,409 medical patients to safety (The U.S. Coast Guard & Hurricane Katrina, 2009).

Although international armies do not aid with disasters that take place on U.S. soil, the U.S. military is quite active in humanitarian missions across the world. For example, the United States Air Force conducted several humanitarian missions during the 2004 Tsunami in Southeast Asia and the Georgian/Russian conflict (Summers, 2010).

International aid agencies

International aid agencies carry out the distribution of aid in affected areas. Many organizations such as USAID, EuropeAid and the International Committee of the Red Cross collect donations and coordinate the distribution on the ground. The Red Cross, an all-volunteer organization, has

been involved in most major humanitarian disasters including but not limited to the Asian Tsunami of 2004 and the earthquake in Haiti in 2010. Agencies such as the Red Cross focus on meeting the survivor's most urgent need such as providing clean water, tents, toolkits, vaccinations and immediate medical care (How the Red Cross is Helping, 2009).

Private companies

Although private companies traditionally donated to disaster relief without physically getting involved, a new era of corporate social responsibility shows more and more companies trending towards partnering with aid agencies and providing materials and services directly (Tomasini, 2009). Many large companies now partner with the Chamber of Commerce' Business Civic Leadership Center which serves as a clearing house for the goods or services required by the affected governments and municipalities (Business Civic Leadership Center). Companies such as Wal-Mart and Home Depot were instrumental in providing relief items to the survivors of hurricane Katrina and most agree that their response was much more effectively executed than FEMA's (Horwitz, Wal-mart to the rescue, 2009). The role of business organizations such as the BCLC is to facilitate networking and information sharing between governmental agencies and private companies. In particular, the BCLC performs research on prior disasters and shares the lessons learned through publications and information sharing events. It also advances public private partnerships with federal, state and local governments like SBA and FEMA (Business Civic Leadership Center).

The biggest problem with corporate involvement in disaster response is the cultural conflict between a for-profit company and a not-for-profit relief agency. Additionally, there is

little inter-organization communication and/or coordination which leads to poor requirements gathering (Van Wassenhove, Stapleton, & Tomasini, 2006).

1.4.3 Military's response to disasters

In addition to researching corporate response to disasters, our team also explored several closely related topics such as military logistics to gain insights into the challenges of such an undertaking. Col. Bill Summer's presentation (1/20/2010 at MIT) on the United States Air Force's response efforts during Tsunami Relief in Southeast Asia and the Georgian/Russian conflict was particularly helpful in understand the military's strategic approach to disaster response. Specifically, the presentation mentioned that eight critical factors determine success in disaster response: speed of response, situational awareness, distribution management, strategic communications, planning and organization, coordination, existing theater engagement and medical capabilities. Each aspect was discussed in detail along with several examples. This presentation was one of the most valuable sources that helped us understand the strategies employed by the military, some of which are transferrable to the private sector (Summers, 2010).

1.4.4 Corporate response to disasters

We further researched preparedness and immediate response and uncovered the following: from an initial assessment it seems that both Home Depot and Wal-Mart performed well in their recovery efforts during hurricane Katrina due to good preparation, leveraging the local

knowledge of its employees in the affected areas and expertise in logistics (Horwitz, Wal-mart to the rescue, 2009).

As mentioned above, Wal-Mart is considered one of the main players in disaster response during hurricane Katrina, so our team explored the company's involvement to get a better sense of their role. In his article titled "Wal-Mart to the Rescue", Steven Horwitz explores Wal-Mart's involvement in providing humanitarian aid during hurricane Katrina in 2005. Horwitz notes that in the three weeks following the hurricane's landfall, Wal-Mart deployed 1,000 employees and close to 2,500 truckloads of relief supplies to the hard hit areas. Additionally, their stores re-opened quickly and offered large amounts of free merchandize including prescription drugs to those in need. Ultimately, his paper compares Wal-Mart's quick and timely response to FEMA's dismal performance and concludes with the following remark, "Disaster policymakers who ignore the latter half (corporate involvement) of the story do so not only at their own peril, but also at the peril of millions of Americans who may be the next victims of another disastrous government disaster-relief effort." (Horwitz, Wal-mart to the rescue, 2009).

Andrew Ward of the Financial Times discusses the pre-emptive actions taken by Home Depot, another Katrina hero, before the hurricane even made landfall. The article mentions the use of dedicated command centers, preventative procurement, logistical preparedness and the role of information technology in disaster response (Ward, 2005).

1.4.5 Example of government coordination with corporations

As mentioned before, one of the needs ranked higher during disaster recovery efforts is the need for coordination between government agencies and all participating entities in general. Receiving donations that are not needed in a particular recovery effort can further stress the system and lock up resources that could be better allocated in other efforts. In order for this coordination to take place, we believe it is of utmost important to build pre-existing relationships with the proper organizations. One interesting example of such organizations is Florida's State Emergency Response Team (SERT).

Florida's State Emergency Response Team is responsible for preparing the state's response to emergencies and the efforts to recover from them. SERT plans and responds for all kinds of disasters. Its planning and execution duties include running training and exercise programs, acting as a liaison with federal and local agencies, and providing technical assistance for preparing emergency plans and procedures (State of Florida Division of Emergency Management, 2008). They summarize their activities in four main categories: preparedness, which encompasses statewide emergency management procedures; response, which includes coordination and planning at the state level; recovery, by providing disaster relief to the affected population; and mitigation, by reducing or eliminating risks.

There are many reasons for considering Florida's efforts as an example to follow in disaster management and recovery initiatives. Due to its location, Florida is prone to suffer natural disasters every year, mainly hurricanes. For example, during 2004 the state was hit by one tropical storm and four hurricanes in a period of 43 days starting with tropical storm Bonnie on August 12, 2004 and being followed by hurricanes Charley, Frances, Ivan and Jeanne.

This succession of storms triggered the largest series of disaster relief operations in the U.S. until hurricane Katrina (Hagan & Nunn, 2008). These periodic disaster relief efforts provide a learning opportunity that Florida's SERT has managed to hone into effective procedures.

Within Florida's Comprehensive Emergency Management Plan, the State Unified Logistics Plan developed by SERT discusses in great detail the roles and responsibilities of every actor involved during disaster relief efforts. Specifically, the plan specifies that the private sector can and is often used in the provision of private-based commodities and equipment. It also specifies that private companies can provide logistical support to assist the state's efforts with distribution, transportation, or the overall management of logistical activities (State of Florida Division of Emergency Management, 2008). This is especially important for local companies that have private fleets and available warehousing space that might be used as a so-called Logistics Staging Area (LSA). For example, K-Mart's regional distribution center in Ocala, Florida was used as an LSA during the 2004 relief efforts (Hagan & Nunn, 2008).

Nevertheless, the private sector's involvement during relief efforts is coordinated accordingly by using pre-existing agreements. For example, the state of Florida has already signed such agreements with companies like Home Depot, Lowes, Publix, Winn Dixie, and Wal-Mart. These agreements are drafted and specified in detail in a Memorandum of Understanding or Agreements which is signed by each company and SERT. Additionally, during each relief effort, further development of Mutual Aid Agreements and Memorandums of Understanding is required and each one is signed for every action performed during emergencies (State of Florida Division of Emergency Management, 2008).

Florida's SERT is just one example of a state's willingness and resourcefulness to establish coordination between government and private sector disaster relief efforts. All states have a federally mandated emergency management office and each office has similar but slightly different ways of cooperating between organizations. If a private company wishes to get involved in state emergency preparedness procedures one useful resource to start with is the Emergency Management Assistance Compact (EMAC). In their webpage, EMAC lists basic information, including contact information, for each state's emergency management offices.

1.4.6 Trends in corporate response to disasters

An INSEAD study titled "Corporate responses to humanitarian disasters" explores the mutual benefits of private-humanitarian cooperation and reviews instances of this from prior humanitarian disasters. One research report in particular titled "Corporate Responses to Humanitarian Disasters" stands out from the rest because it outlines current trends in disaster response, corporate roles in relief and provides several case studies of companies such as Philip Morris and GlaxoSmithKline and their approach to disaster response. This research recognizes that although cash donations are still the favored option for humanitarian organization, Corporate-humanitarian partnerships that include the transfer of expertise can benefit both parties immensely and disaster response is trending more toward this option than the traditional donations. (Van Wassenhove, Stapleton, & Tomasini, 2006)

1.5 Introduction wrap-up

In summary, our research is focused on learning what a disaster is and how disaster management efforts work afterwards; recognizing what stakeholders participate during disaster recovery efforts; and extrapolating best practices applied during past disasters by companies that have been deemed successful at such efforts. After creating our research background, we followed a series of steps for constructing our best practices framework.

2 Methodology

This thesis reviews high-level strategies employed by several large companies in the U.S. while responding to a disaster by using the process of content analysis. Our research includes journal articles, book chapters, academic theses, newspaper articles, interviews, corporate websites, and informal conversations to gather the data. We first look at Wal-Mart and Home Depot's approach to disaster response, form an initial best practices framework and then deductively check if other companies have commonalities with it. Most of the data being researched will be secondary data except for the interviews and presentations we're including in our work which we conducted/attended ourselves.

First, we apply inductive content analysis while researching Home Depot and Wal-Mart's response to disasters. Generally speaking, inductive content analysis is applied when there is not enough former knowledge about a phenomenon or if this knowledge is fragmented (Lauri & Kyngas, 2005). In this particular case, inductively analyzing these two companies allows us to form a starting category of strategies that we hypothesize are being applied by several other companies as well.

It is important to note that when formulating strategy categories by inductive content analysis, we needed to make informed interpretations as to which strategies to put in the same category (Dey, 1993). The general process to come up with the final strategy categories consisted of the three main processes that both inductive and deductive analysis go through: preparation, organizing and reporting (Elo & Kyngas, 2008). The final report is the strategy categories that we will furthermore test while researching other company profiles.

After coming up with an initial and hypothetical set of strategy categories, we began researching whether these strategies are being employed by other companies across different industries. This might also be recognized as the deductive content analysis process of testing categories, concepts, models or hypotheses (Marshall & Rossman, 1995). As mentioned before, in deductive content analysis it is possible to choose either only the aspects from the data that fit the categorization frame or to choose those that do not. In this way, aspects that do not fit the categorization frame can be used to create their own concepts, based on the principles of inductive content analysis (Elo & Kyngas, 2008). If in the research of other companies we came across strategies that did not fit the current categories, we created new categories which are summarized in the best practices framework section.

2.1 A note on content analysis

Since most of the research will be focused on publicly available material about the companies we are profiling, this thesis applies a methodology based on content analysis. This study will use entire articles as units of analyses. By definition, content analysis provides a method to analyze written, verbal or visual messages used in traditional communication methods (Elo & Kyngas, 2008). Recently, the application of content analysis methodologies has been steadily growing and being applied in communication, journalism, sociology, psychology and business (Neundorf, 2002). Our objective is to apply content analysis in order to summarize each company's strategies into limited categories that can be compared across several industries.

There are several reasons that make content analysis a good fit for our methodology. First, the categorization and depth of analysis are flexible enough for different types of research

design (Harwood & T., 2003). Additionally, this method can be simplified or complicated as much as the research topic requires (Neundorf, 2002). Finally, content analysis can be applied both inductively and deductively. In inductive content analysis, the categories are derived from the data being analyzed (Lauri & Kyngas, 2005), which fits the first part of our research when we initially decide the categories to be compared. Afterwards, a deductive approach – which is based on existing theories or models (Burns & Grove, 2005) – helps this thesis find if the selected categories exist in other companies.

2.2 Interviewing to fill in the blanks with primary data

After gathering all the available information from sources of secondary data, we proceeded to fill in the missing pieces of information within our framework. If we did not find evidence regarding a particular strategy being employed by a particular organization, we proceeded with an interview to corroborate whether the organization does in fact practice this strategy but has not been published, or whether they are actually missing that strategy in our framework.

Since the number of interviews to be conducted was small, we decided a survey interview was too formal for this case. According to Kvale's view of survey interviewing goals, it was not important to us that the data be exactly reproducible by other interviewers and a predetermined sequence and wording of questions was of no particular benefit to our research (Kvale, 2009). Survey interviewing would in fact be useful if this research was expanded to include a considerably larger number of organizations.

Instead of survey interviewing, we used a qualitative research interview approach since we already had knowledge of the topic of the interview and we needed to specifically tailor the

questions being asked to what our interviewees were answering. The production of data in our interviews went beyond mechanically posing a set of questions, we tried to direct the probing for information by guiding and following up with second questions (Kvale, 2009).

Additionally to using a qualitative interview approach, our questioning followed the linked stages that Rubin & Rubin propose for qualitative interviewing: introduction of interviewer and topic, asking easy questions, asking tough questions, toning down, and closing while maintaining contact (Rubin & Rubin, 2005). This stage model was particularly useful to us since we did not want our interviewees to become defensive when we asked the tough questions: specific strategies that we believed their organizations were not actually employing.

The stage model of qualitative interviewing can be used with different patterns of questioning. For our research, we decided to use a tree-and-branch structure since our research is divided into equal parts – or strategies – and we wanted to cover each part with a main question (Rubin & Rubin, 2005). We further modified this pattern and mixed it with the river-and-channel pattern. A river-and-channel pattern is useful when you want to explore an idea, a concept, or an issue in great depth, following it wherever it goes (Rubin & Rubin, 2005). This was especially true in our tough questions, when we asked for specific strategies where we lacked evidence of the organization actually using them.

2.3 Methodology wrap-up

Based on the strategies identified during our inductive analysis of Home Depot and Wal-Mart's disaster response strategies, we came up with an initial framework of best practices during disaster recovery efforts. The framework includes actions taken for all three steps of disaster

management: preparation, immediate response and reconstruction. We then proceeded to consolidate the strategies employed by the two companies into a common best practices framework. This framework will then be used to benchmark the disaster response strategies of other companies.

3 Wal-Mart's example during disaster recovery efforts

Wal-Mart's disaster response efforts during hurricane Katrina were seen as one of the few bright spots in an otherwise poorly managed relief operation. A quick search on Google Scholar shows that Wal-Mart has significantly more articles analyzing its relief efforts during hurricane Katrina than any other Fortune 25 American company as shown in Figure 3. In fact, some academic articles directly compare FEMA's slow reaction to Wal-Mart's timely response and suggest reasons for the occurrence (Horwitz, Wal-mart to the rescue, 2009). Although our scope is not limited to hurricane Katrina, we focus on this particular event because this was a big victory for Wal-Mart and it serves as a very good case study for private response to disasters handled by an American company within the U.S. borders.

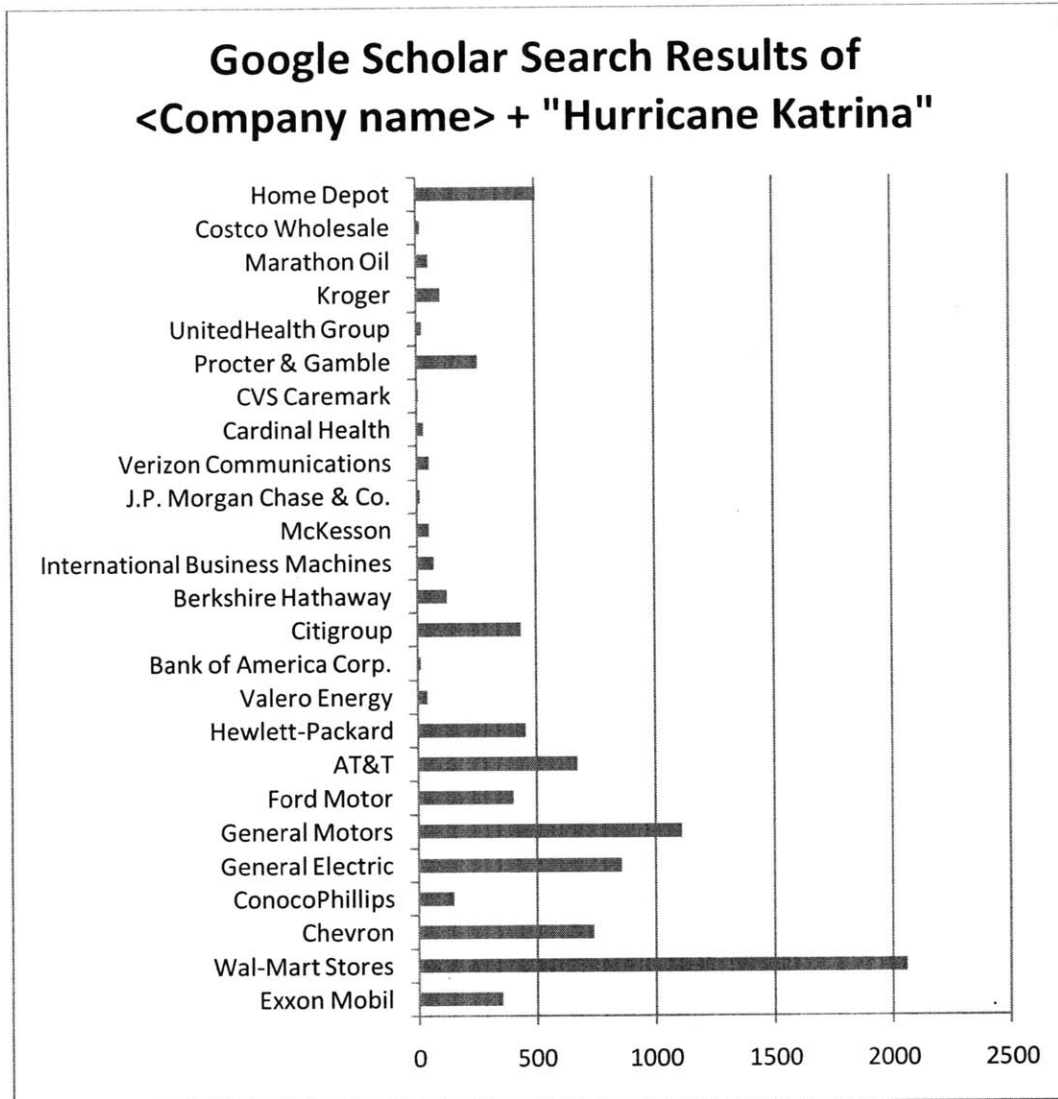


Figure 3: Search results from Google Scholar

In all, Wal-Mart supplied 2,498 trailers of merchandize, over three million gallons of drinking water, \$17 million in donations to relief organizations and \$3.5 million in donated merchandize (Sultemeier & Koon, 2008). Outlined below are the strategies adopted by Wal-Mart during disaster response. Our goal is to understand these strategies, aggregate them with similar strategies employed at other companies and recommend a framework.

3.1 Wal-Mart corporate snapshot

Wal-Mart Stores, Inc. incorporated in October 1969, operates retail stores in three business segments: Wal-Mart U.S., International and Sam's Club. The Wal-Mart U.S. segment operates retail stores in all 50 states, with supercenters in 48 states, discount stores in 47 states and Neighborhood Markets in 16 states. Wal-Mart U.S. does business in six strategic merchandise units across several store formats, including discount stores, supercenters and Neighborhood Markets. . Its grocery merchandise consists of a line of grocery items, including meat, produce, deli, bakery, dairy, frozen foods, floral and dry grocery, as well as consumables, such as health and beauty aids, household chemicals, paper goods and pet supplies. Its entertainment merchandise contains electronics, toys, cameras and supplies, photo processing services, cellular phones, cellular service plan contracts and prepaid service. The company's hardlines merchandise consists of fabrics and crafts, stationery and books, automotive accessories, hardware and paint, horticulture and accessories, sporting goods, outdoor entertaining and seasonal merchandise. Its apparel merchandise includes apparel for women, girls, men, boys and infants, shoes and jewelry. Its health and wellness includes pharmacy and optical services. Its home includes home furnishings, house wares and small appliances (Wal-Mart Stores, Inc.).

3.2 Disaster preparation and training

Wal-Mart spends a significant amount of time and money preparing its managers and associates for disasters. Proactive planning includes Emergency procedures, flip charts, corporate business continuity plans and pandemic planning. Preparedness initiatives include associate and manager preparedness training exercises, store closure procedures and disaster

communication protocol. For example, the company uses a toll free number called the Associate Emergency information line which links to their internal Incident Management website (discussed later in the paper). This line allows both managers and associates to provide detailed in-field reports which are then digitized and shared on the website in a timely manner (Sultemeier & Koon, 2008).

3.3 Defined crisis management command structure

At the heart of Wal-Mart's disaster management operations is the crisis management team (CMT) which consists of the Local Incident Management Team, the Emergency Operations Center (EOC) and the Strategic Response executive group. The Local Incident Management group handles the day-to-day tactical crisis support and remains in constant communication with the EOC. The EOC is the communications hub for the rest of the groups and reports to the Crisis Management Team. The Strategic response group interfaces with external organizations such as governmental agencies and business organization such as the Business Roundtable (Sultemeier & Koon, 2008).

3.4 Emergency stockpiles

Wal-Mart stockpiles critical items in warehouses around the US so, that they're able to respond quickly. Of its 100 distribution centers nationwide (2004 number), eight were designated disaster distribution centers with a total of \$4.7 Million in merchandize rationed for use in emergencies only. These supplies included water, batteries, lanterns, lamp oil and ready to eat

food all of which were stored on easy to move pallets (Horwitz, Wal-Mart Way in Disaster Preparedness/Response: Policy Implications, 2008).

3.5 Emergency operations center

The Emergency Operations Center (EOC), a 2,900 sq ft facility with room for 48 employees, is primarily used as communications hub responsible for monitoring disruptions and mobilizing a response. The center operates under three levels of activation with the highest level being a large hurricane that could potentially disrupt hundreds of stores (Horwitz, Wal-Mart Way in Disaster Preparedness/Response: Policy Implications, 2008). During hurricane Katrina, this center served as a centralized point of command and interfaced with both its own staff on the ground and with external parties such as the state governments and other companies involved in the effort.

3.6 Technology and communication infrastructure

Wal-Mart's Alarm central, which works in conjunction with the EOC, is responsible for monitoring the company's 5,000 plus facilities for both natural and man-made disruptions (Sultemeier & Koon, 2008). With the help of sophisticated technology, a six to eight employees team can monitor the companies' far flung facilities and can mobilize a response in case of a disruption within a few minutes. In case of an incident, all relevant information is available on the company's internally developed Incident Management Website. The site collects real time data from external databases and has the local news, crime advisory and webcam access to the site of the incident. Wal-Mart also uses HurrTrak, a weather tracking software that analyzes

Atlantic Tropical Storms and their potential impact on the about to be hit areas (Sultemeier & Koon, 2008).

3.7 Interfacing with coordinating agencies

Wal-Mart interacts with both the Federal and the State Government Agencies not only during disasters but also on an on-going basis for planning. For example, the company is in contact with both the Department of Homeland Security (DHS) and FEMA through their private sector offices. It also has direct points of contact within state management agencies through professional organizations like NEMA (National Electrical Manufacturers Association) and IAEM (International Association of Emergency Managers). Wal-Mart is also a member of business organizations such as the U.S. Chamber of Commerce's Business Civic Leadership Council (BCLC), the Business Roundtable and the Business Executives for National Security (BENS) (Sultemeier & Koon, 2008).

3.8 Partnering with other private sector companies

In addition to partnering with the government and business organizations, Wal-Mart also coordinates response efforts with private companies such as The Home Depot, Walgreens, Target and AT&T.

3.9 Using the local knowledge of the network

Due to the retailer's vast network of store, Wal-Mart typically has associates that are native to the affected area and know it well. Further, Wal-Mart field associates are encouraged to

participate in the local business community and maintain relationships with the community. During hurricane Katrina, Wal-Mart heavily relied on the knowledge and decision making of its local associates. The involvement of the local players coupled with the decentralization of decision making allowed the company to make plans ahead of time and for the local actors to direct resources using their own best judgment. This improved the speed of the response as decisions were made on the spot and didn't have to await approval (Horwitz, Wal-mart to the rescue, 2009).

3.10 Areas for growth as seen by Wal-Mart

Through this analysis, it is evident that Wal-Mart can provide expertise in the areas of logistics, transportation, information systems and merchandise. Through its local teams, it can also do damage assessment and provide shelter for relief workers and aid recipients. However, the company states that it still needs more partnerships, defined processes and expectations, an open discussion of strengths and weaknesses and better information flow between partners and from the government (Sultemeier & Koon, 2008). Although Wal-Mart along with a few peers was at the forefront of private disaster response, the company still learned valuable lessons which it shares openly

4 Home Depot's best practices for disaster recovery efforts

The Home Depot has been widely recognized for its efforts during Hurricane Katrina. A Google Scholar search with the keywords "home depot"+"hurricane Katrina" yields close to 500 results which share information about the company's first response efforts, donations, investments plans and leadership during times of crisis (Figure 1). In fact, the Harvard Business Review even has a case study on how Home Depot provided everything from shovels to other miscellaneous building supplies during this time in a publication titled "The Home Depot: Leadership in Crisis Management" (Herman B Leonard, 2009). Home Depot's effectiveness in their response can be attributed to several factors such as preparedness, strategic partnerships with governmental agencies and suppliers, local knowledge and a dedicated command center staffed with a cross functional disaster response team.

4.1 Home Depot corporate snapshot

The Home Depot, Inc., incorporated in 1978, is a home improvement retailer. The Home Depot stores sell an assortment of building materials, home improvement and lawn and garden products and provide a number of services. The Home Depot stores average approximately 105,000 square feet of enclosed space, with approximately 24,000 additional square feet of outside garden area. As of January 31, 2010, it had 2,244 The Home Depot stores located throughout the United States, including the Commonwealth of Puerto Rico and the territories of the United States Virgin Islands and Guam (U.S.), Canada, China and Mexico. A Home Depot store stocks 30,000 to 40,000 products, including both national brand name and own items (The Home Depot, Inc.).

4.2 Preparedness for disasters

The Home Depot pays a great deal of attention to weather related events and has an entire section of their website dedicated to disaster preparedness in case of a drought, earthquake, flood, hurricane, snow storm, tornado and wildfires. Each disaster is broken down into two sections: Prepare and Recover with maps, videos and relevant products highlighted for each stage. Although the aim of this website is to educate the consumer about the type of precautions to take, it also allows Home Depot to advertise the services it can offer and shows that the company really has spent time thinking about each one of these scenarios ahead of time (Weather Center).

4.3 Planning in advance

The key to Home Depot's effectiveness in providing goods and supplies to the affected areas is in the way they planned the operation before executing it. From creating a war room to put all the relevant people in one location to advance booking hotel rooms in about to be hit towns, the company put a lot of proactive thinking into their response just as any large company does before diving into a large project. As an example, Home Depot advance booked hotel rooms in Baton Rouge, Louisiana in anticipation of additional staff that would travel to the affected areas in the days and weeks following the hurricane (Ward, 2005).

4.4 War room

From the time when Hurricane Katrina was 600 miles away, Home Depot's Disaster Response war room was fully operational with cross functional teams of employees handling everything from stocking the stores in about to be affected areas to anticipating post-hurricane demand. The war room was furnished with TV monitors that tracked storm activity which provided those involved with the position of the storm and the remaining time window (Ward, 2005).

4.5 Strategic stockpiles

Home Depot also forecasts potential demand for items typically required during hurricane season and stock piles them in strategic locations close to the hurricane strike zones during the hurricane season (June – November) every year. For example, electricity generators are extremely sought after hurricanes due to the damage sustained to the electric grid and consequential blackouts. As such, these items are stocked in bulk in the about to be effected areas proactively (Ward, 2005).

4.6 Employing advanced technology

In addition to the above mentioned steps, Home Depot, like most major companies with significant infrastructure owned advanced shipping systems and weather tracking devices using which they were able to identify communities that would be hit the hardest. By leveraging this technology, they were able to direct commodities from other stores to supply those in need (Rebuilding Hope & Homes, 2006).

4.7 Proactive procurement

During hurricane Katrina, Home Depot was proactive in understanding the supplies needed after disasters and proactively procured these items before the hurricane made landfall. Supplies such as generators, flashlights, batteries and plywood are in high demand but often very difficult to procure once the disaster has already struck. As such, the company procured such items in larger than normal quantities and stockpiled them in strategic locations close to the disaster strike zone ahead of time. The end result was that Home Depot was able to better mitigate supply chain risk by proactive procurement and was able to quickly deliver these supplies where needed (Schmitt & Snyder, 2007). In times of emergency, Home Depot freezes prices on all natural disaster commodities (Rebuilding Hope & Homes, 2006).

4.8 Resource mobilization within the organization

Team Depot, an associate led volunteer program within Home Depot works with The Home Depot Foundations' (charitable arm of Home Depot) affiliates and donates time to charitable projects. In times of disaster, the company mobilizes volunteers from across the country to assist in strike-zone areas ensuring stores open quickly and relief is provided to both affected associates and customers. In 2005, The Home Depot partnered with organizations such as The Home Depot Foundation, American Red Cross, Salvation Army, Hands On Network, United Way and other community leaders to donate more than \$11 million to the long-term recovery and rebuilding of the Gulf region (Rebuilding Hope & Homes, 2006).

4.9 Forming pre-existing partnerships

Similar to Wal-Mart, the Home Depot partners with business associations such as the US Chamber of Commerce's Business Civic Leadership Center (BCLC) as well as government organizations such as FEMA (Business Civic Leadership Center). In 2005, The Home Depot also partnered with the American Red Cross on a three-year, \$6.6 million initiative to educate 1 million people about disaster preparedness. This partnership would provide grants to 40 Red Cross chapters across the country to support local preparedness projects, as well as offer a series of national education clinics select The Home Depot stores (Rebuilding Hope & Homes, 2006). Such partnerships help private companies break out of a silo and work with other private responders, the government and NGOs in a more effective manner. It also allows companies to go beyond donations and contribute in terms of goods and services based on their particular strengths.

4.10 Donations

In addition to making donations to hurricane Katrina's relief effort, the BCLC website also lists Home Depot as a donor to the California wildfires (2007) the Chinese earthquake (2008) and the Haitian earthquake (2010) (Business Civic Leadership Center). Further, the company continues to contribute to victims of Hurricane Katrina by donating tools and helping to launch Rebuilding Hope & Homes, an organization established to help rebuild the lost homes of Katrina victims (Rebuilding Hope & Homes, 2006).

5 Consolidation of disaster response activities of Wal-Mart and Home Depot

In general, Home Depot's and Wal-Mart's efforts in disaster management overlap into what we denoted as categories of best practices. After our initial inductive analysis of both companies, we identified 9 categories as shown in Table 1.

Companies	Wal-Mart	Home Depot
Pre-existing disaster preparedness plans	X	X
Command structure	X	X
Emergency stockpiling	X	X
War room	X	X
Central communications portal	X	
Standing partnerships	X	X
Use local employees' knowledge	X	
Volunteer mobilization		X
Donations	X	X

Table 1: Initial categorization of identified best practices

The next section of this document proceeds to deductively test these nine categories in five companies that range from retailers to service providers. If a best practice is identified in any of the five companies that does not comfortably fit into the categories listed in Table 1, then a new category will be added to the final framework.

The following sections look at individual companies that have effectively contributed to disaster response and highlight the strategic and operational aspects of their response. Whenever a particular strategy is identified, we try to categorize it into our existing framework (see Table 1).

6 GlaxoSmithKline's approach to disaster response

GlaxoSmithKline (GSK), a UK based pharmaceutical giant, has been at the forefront of disaster relief for many years. Their major contributions come in the form of cash and medicinal donations. Their approach has usually been to partner with a local humanitarian relief agency and donate antibiotics/medicines for distribution through the agency. Most recently, GSK donated medicines valued at more than \$ 1 Million to the Haitian population during the 2010 earthquake. They did this by partnering up with non-profit partners: AmeriCares, Direct Relief International, Health Partners International of Canada, MAP International, IMA World Health and Project Hope (Responding to disasters around the world, 2010). GSK has made similar donations to relief efforts in several natural disasters in Asia Pacific including but not limited to the 2009 Indonesian earthquake, 2009 Typhoon Ketsana in Vietnam and the 2004 Asian Tsunami.

6.1 GlaxoSmithKline corporate snapshot

GlaxoSmithKline plc (GSK), incorporated on December 6, 1999, is a global healthcare group, which is engaged in the creation and discovery, development, manufacture and marketing of pharmaceutical products, including vaccines, over-the-counter (OTC) medicines and health-related consumer products. GSK's principal pharmaceutical products include medicines in the therapeutic areas, such as respiratory, anti-virals, central nervous system, cardiovascular and urogenital, metabolic, anti-bacterials, oncology and emesis, dermatological and vaccines. The Company's segments include Pharmaceuticals and Consumer Healthcare. GSK's principal pharmaceutical products are directed to nine therapeutic areas, including dermatological,

respiratory, central nervous system, anti-virals, metabolic, vaccines, cardiovascular and urogenital, anti-bacterials, and oncology and emesis. The Company competes with Abbott Laboratories, Amgen, AstraZeneca, Bristol-Myers Squibb, Eli Lilly, Johnson & Johnson, Merck, Novartis, Pfizer, Roche Holdings and Sanofi-Aventis (GlaxoSmithKline PLC).

6.2 Crisis, continuity and preparedness plans

GSK maintains crisis, continuity and preparedness plans across the business for implementation during times of disaster. In fact, their policy mandates the creation of plans that outline authorized business recovery strategies, key areas of responsibility and communication routes in their employee guide to business conduct. The company puts the responsibility of continuity plan development and implementation on business unit heads. However, the ultimate responsibility for responding to crises rests with The Corporate Crisis Management Team (CCMT). Further, GSK's policy states that key suppliers and outsourcing partners also have adequate and current business continuity plans to recover from supply chain disruptions (Employee Guide to Business Conduct).

6.3 Corporate Crisis Management Team

The ultimate responsibility of business continuity plans rests with the GSK business unit heads. These plans are required to work in concert with existing plans for risk mitigation, loss prevention, emergency response and employee health (Employee Guide to Business Conduct). Once a disaster does strike, the Corporate Crisis Management Team (CCMT) assumes control of the situation and orchestrates a response. In times of humanitarian disasters, various

stakeholders work together to achieve the goal of delivering the right medication to the affected population. Typically, this effort starts with the aid agency requesting GSK for specific medication. GSK then confirms the need with its most high ranking official in the affected region who must approve the transfer. Typically most the communication is carried over teleconferencing with all the key stakeholders which may happen daily during times of disaster (Van Wassenhove, Stapleton, & Tomasini, 2006).

6.4 Preventative procurement and emergency stockpiles

GSK takes a proactive approach to disaster planning. The company donates medicines to relief organizations ahead of time so that they can be distributed and used quickly once the disaster strikes. The company has partnership with five selected nonprofit organizations and relief charities: AmeriCares, Direct Relief, InterChurch Medical Assistance, MAP International, and Project HOPE. These organizations are allowed to choose medicines from GSK's inventory on a yearly basis to establish a form of pre-positioned disaster response in the regions where they are present. The donation process which is endorsed by the corporate executive team works as part of the company's core procurement process providing the same level of transparency and accountability as its regular transactions (Van Wassenhove, Stapleton, & Tomasini, 2006).

6.5 War room

GSK's Corporate Crisis Management Team (CCMT) has the ultimate responsibility for the nature and scope of GSK's response to crises. The CCMT is the group in the company that is notified about all crisis situations, performs a reviews the necessary costs, management activities and

decision making within the company. This group remains in contact with the high ranking officials on ground and makes the determination of when to escalate relief efforts or re-allocate supplies. Essentially, CCMT serves as command central during times of disaster or interruption in usual business activity (Employee Health Pandemic Preparedness Plan, 2008).

6.6 Partnerships

GSK realizes that the strength of their relief efforts is in creating and providing life saving medication. As such, they let their five partnering relief agencies perform an on-ground assessment and determine the needs which are communicated back. The company focuses most of its energies in ensuring the right medications are ordered in the right quantities and delivered on time. They do this through their pre-existing procurement process which is run as a commercial procurement process.

6.6.1 Sharing of best practices with partners

On top of partnering with relief agencies, GSK shares its knowledge and expertise in disaster response with other members of the pharmaceutical industry. It participates in the Partnership for Quality Medical Donations (PQMD) with 13 NGOs and 14 other pharmaceutical and medical equipment manufacturers (Van Wassenhove, Stapleton, & Tomasini, 2006).

6.7 Humanitarian Product Donation Program

GSK's Humanitarian Product Donation Program heavily involves local general managers as they're the ones ultimately responsible for assessing the need and approving the transfer of

medication through relief agencies. The company has clearly defined internal processes for responding to disasters. It requires the most senior executive in the affected region to take the lead on the crisis. Within one to two days, a review of what is needed on the ground is discussed with the right stakeholders. Leveraging the local knowledge of its employees allows GSK to ensure that donated medicine actually helps the affected population and is not wasted due to confusion during the relief effort (Van Wassenhove, Stapleton, & Tomasini, 2006).

6.8 Volunteer mobilization through PULSE

Although our research did not find large employee mobilizations during times of disaster, GSK does have a program called PULSE which gives employee the opportunity to embed themselves in a partnering NGO for three to six months and sharing their skills and knowledge. Further, Orange day which was globally introduced only in January 2009, allows employees to take one fully paid day to volunteer for a community project which they support (Employee involvement, 2009).

6.9 Donations

Since GSK primarily provides donations in the forms of cash and medicines, they have a streamlined and transparent donation process. As mentioned above, the donation process is managed like a core procurement process and includes seven basic steps. GSK first offers its partners medicines either from its own inventory or directly from its manufacturers. The order is then sent to GSK's US office for processing and dispatch. Following this, the order is dispatched to the partner's regional warehouse which are equipped with monitoring and

tracking systems required by GSK. When medicines are used, partners inform GSK about the location and quantities shipped. GSK then contacts its general manager in the area where medicines are being shipped to ensure accountability and compliance. Once the general manager approves, medicines are shipped to the desired locations (Van Wassenhove, Stapleton, & Tomasini, 2006).

7 FedEx's approach to disaster response

Disaster response is a part of business as usual for the logistics giant FedEx. In 2004 the company had to activate contingency plans on 37 tropical storms. (Kratz E. F., 2005) Other emergencies include typhoons, earthquakes and civil unrest just as a few examples. In order to deal with such situations, FedEx has created disaster mitigation plans and has many dedicated resources to monitor and respond to such scenarios. FedEx also partners with humanitarian organizations such as the Red Cross to deliver aid during times of disaster. The company's strength is its supply chain which is very resilient and active when most other companies are in damage control mode. Just recently, FedEx donated more than \$1.8 million in cash and transportation by moving more than 850,000 pounds of critical supplies to site of the Haitian earthquake. The relief supplies include medical supplies, water cleaning equipment and family just to name a few. (Business Roundtable member company contributions - 2010 Haiti Earthquake, 2010) Heavy operation planning goes into FedEx's logistical execution and this snapshot will explore the key takeaways from the company's prior disaster response efforts.

7.1 FedEx corporate snapshot

FedEx Corporation (FedEx) is a holding company. The company provides a portfolio of transportation, e-commerce and business services through companies that compete collectively, operate independently and manage collaboratively, under the respected FedEx brand. These companies are included in four business segments: FedEx Express, FedEx Ground, FedEx Freight and FedEx Services. Federal Express Corporation (FedEx Express) is the express transportation company, offering time-certain delivery within one to three business days. FedEx

Ground provides day-certain service to every business address in the United States and Canada, as well as residential delivery through FedEx Home Delivery. FedEx Freight is a United States provider of less-than-truckload (LTL) freight services through its FedEx Freight business (regional LTL freight services) and its FedEx National LTL business (long-haul LTL freight services). FedEx Services offers a range of supply chain solutions, including critical inventory logistics, transportation management, fulfillment and fleet services, through its FedEx Global Supply Chain Services subsidiary (Fedex Corporation).

7.2 Always ready for the unexpected

Disaster response is a critical success factor for FedEx's business model. Since the capability to respond to disasters already exists within the company, the logistics giant has made a commitment to utilizing their network to support disaster preparedness and contingency planning by partnering with several humanitarian organizations. Preparedness plans at FedEx include pre-positioning of 60-80 pallets of basic relief supplies at four global forward-response centers. Since, FedEx is never more than 24 to 72 hours away from any site in the world, these pre-positioned supplies can be the first ones to reach any affected site and can have a tremendous impact. (Relief Support) Further, FedEx can rely on its own contingency plans to help during disasters. For example, the company has eight disaster kits ready for deployment at their Memphis facility, each of which has two tons of supplies such as fuel and communications gear. Also, each night, the company keeps five empty aircraft in the air standing by to replace a broken-down plane or assist with an unexpected surge in volume. (Kratz E. , 2005) Elaborate

preparation plans such as these allow FedEx to respond to crises with minimal time wasted and enables the company to be effective in disaster response.

7.3 Preventative procurement and emergency stockpiles

As mentioned under the Disaster Preparedness Plans section, FedEx proactively positions basic relief supplies at its forward response centers. It also has disaster kits in place for deployment ahead of time so, that disaster aid is no more than 24 to 72 hours away from its destination at any given moment. Examples of this include the pre-positioning of 30,000 bags of ice, 30,000 gallons of water, and 85 home generators outside Baton Rouge and Tallahassee during hurricane Katrina. The company also dispatched four of its eight dispatch kits (4000 lbs each) in advance to aid in relief efforts. (Kratz E. F., 2005)

7.4 The Global Operations Control

In operations since the first day, the Global Operations Control (GOC) is called the central nervous system of the entire operations at FedEx. The GOC is located at the company's Memphis headquarters and serves as a war room during times of emergencies (Kratz E. F., 2005). It also interfaces with smaller but similar satellite operation control centers around the world to assist them with special situations (FedEx Express Gears Up for Hurricane Season with its Hurricane Contingency Team, 2007). The purpose of the GOC is to primarily keep FedEx's entire fleet of trucks and planes on track. It adds, routes and decommissions aircraft based on several factors one of which is weather. The GOC has its own meteorological center which can forecast weather at both the departure and destination sites for a much shorter time period

than does the national weather service (FedEx by the Numbers). Such capabilities enable smoother coordination of logistics for the entire fleet of the company and are also instrumental during disaster response efforts.

7.5 Using the GOC as a central nervous system

FedEx's centralized disaster response comes primarily from the GOC which has several contingency plans for various scenarios. For example, in 2007, the GOC activated the hurricane contingency team based on the National Oceanic and Atmospheric Administration's (NOAA) announcement of 17 potential storms and hurricanes in the Atlantic. The GOC then activated its Latin American and Caribbean Hurricane Contingency Team located in Miami, FL to ensure it had everything in place to coordinate a response should these storms materialize (FedEx Express Gears Up for Hurricane Season with its Hurricane Contingency Team, 2007). Although the actual response might be executed by the local team, the coordination and marching orders come centrally from the GOC as was the case in this scenario.

7.6 Partnerships

FedEx knows that its strength is in delivering goods intact and on schedule. As such, it partners with humanitarian organizations and volunteers its time and infrastructure to provide aid. Currently, FedEx partners with the American Red Cross, Salvation Army, Heart to Heart International, Direct Relief International and TRANSFORM. For example, the company worked with Heart to Heart to setup the four global forward-response centers for pre-staged relief

supplies. By leveraging FedEx's logistical abilities, these supplies are automatically replenished and never more than three days away from the relief site. (Relief Support)

7.7 Volunteer mobilization

In addition to providing free shipping on disaster relief items, FedEx also allows its employees to volunteer in crisis situations. Volunteers can be pilots who fly planes into affected areas to on ground staff that unload and deliver supplies. For example, in response to Hurricane Wilma in Mexico, FedEx flew one of its DC10s with 62 tons of supplies collected by the Red Cross to the Cancun area. Another shining example of volunteerism at FedEx is the story of Mike Mitchell during hurricane Katrina. Mr. Mitchell, a Project Technical Analyst, watched the devastation on TV and realized that FedEx could assist with the restoration of on-the-ground communications. He suggested donating more than 150 two-way radios for general communications purposes in the area. With the assistance of the U.S. Army's 82nd Division, Mr. Mitchell went to New Orleans and repaired a radio repeater that had been damaged in the storm. As a result, he was able to restore radio communications for the Army, CIA and local law enforcement (Relief Support).

7.8 Donations

In addition to helping with disaster response, FedEx also makes cash contributions to disaster response. Examples include the \$1 Million in cash and in-kind support to the American Red Cross. In 2010, the company donated more than \$1.8 Million to the Haiti Earthquake relief effort moving 850,000 pounds of critical supplies for charitable organizations. Specifically,

during the Haiti relief effort, FedEx worked with World Vision, Heart to Heart, Water Missions, American Red Cross and the Direct Relief International (Business Roundtable member company contributions - 2010 Haiti Earthquake, 2010). A similar donation was made to the Chinese earthquake in 2008 and the Myanmar Cyclone also in 2008. (FedEx Corporation)

8 Disaster management at Target

Target's efforts in crisis management were kick-started after the 9/11 terrorist attacks. The company recognized a need for emergency management and, as a result, created their now well-known Corporate Command Center. With more than 1,700 stores and worldwide offices, Target monitors everything from domestic weather to political disturbances around the world.

8.1 Target corporate snapshot

Target Corporation was incorporated in 1902 and opened their first store in Roseville, Minnesota. Since then, the company has grown to include more than 1,700 stores in 49 states of the U.S. They employ more than 351,000 employees and have annual revenues of over \$65 billion. Target stores generally offer merchandise such as men's and women's clothing, home furnishings, electronic products, sports products, toys, and entertainment products. Target superstores also include services such as photo processing, pharmacy, food restaurants, in-store bakeries, deli, meat, and produce sections. In addition to their stores, Target Corporation offers complimentary products such as company-branded credit cards and sells through alternate channels such as the online store Target.com (Target Corporation, 2010).

8.2 Planning

An important part of Target's success in crisis management and disaster relief efforts is due to their integral approach to crisis management. They have crisis management plans for each facility and work closely with critical departments such as legal, internal communications, community relations and other areas. When all areas are involved, Target is able to provide a

comprehensive response to any event. During Hurricane Katrina, for example, their partnership with internal communications was vital to the local teams (Hayes & Fickes, 2007).

8.3 Corporate Command Center (C3)

Target's Corporate Command Center is located in the company's headquarters in Minneapolis and operates 24 hours a day every day of the year. Its mission is to monitor anything that could disrupt operations at any one of Target's facilities. The technology used in the center is cutting-edge, such as the enhanced version of Google Earth they used to plot the California wildfires of 2009. The system allowed Target to monitor the fallout from street level, air quality in and near the stores, and street routes to make sure trucks can reach every facility and keep products in stock for guests and firefighters who needed supplies (Crosby, 2009).

8.4 Partnering for agency coordination

The systems in Target's C3 coordinate with the federal government's systems. Also a big part of Target's strategy is constant communication with agencies such as the Federal Emergency Management Administration, county health officials, and all state's emergency coordinating councils (Crosby, 2009). This allows Target to have pre-approved plans for getting products into disaster areas and speeds up communication whenever an emergency situation is encountered. As part of Target's commitment to provide support for disaster preparedness, relief and recovery efforts, they partner with the American Red Cross, the Salvation Army, Feeding America and local government agencies and other organizations that help communities prepare for disasters (Target Corp.).

8.5 Setting clear roles

Whenever the C3 identifies a threat, a team representing every division in the company is assembled within the hour. They follow a decision making structure used in law enforcement in which there is always a clearly defined manager in charge (Crosby, 2009). Since decision speed is crucial during an emergency event, Target's structure allows it to coordinate across departments and perform successfully in a very short period of time.

8.6 Weather focus

Even though the teams at Target's C3 monitor other kinds of disruptions, weather plays the most important role in their monitoring technology. Since the National Weather Service forecasts hurricanes and wind speeds with a certain amount of uncertainty, Target's in-house weather service actually provides specific wind speeds and coordinates across every facility thus allowing them to stay open longer than other businesses and to open faster afterward.

9 Coca-Cola's disaster relief as part of a community strategy

Another well-documented company that constantly pops up during press coverage of disaster relief efforts is Coca-Cola. They include their disaster relief efforts as part of a community involvement strategy. Corporate giving at Coca-Cola is focused across priority areas where they feel they can make the greatest difference: water stewardship, active healthy living, community recycling and education (The Coca-Cola Company, 2006-2009).

9.1 The Coca-Cola Company corporate snapshot

With 124 years in business, The Coca-Cola Company traces its roots back to 1886. Since then, it has grown to become the world's largest beverage company. They sell beverages at a rate of 1.6 billion servings per day and operate in over 200 countries. A team of 92,800 company associates worldwide is responsible for the \$31.9 billion dollars in yearly revenues. The company's portfolio of products has grown to more than 3,000 beverage products such as diet and regular sparkling beverages, still beverages such as 100 percent juices, juice drinks, waters, sports and energy drinks, teas and coffees, and mil and soy-based beverages. The Coca-Cola System, which consists of more than 300 bottling partners besides the 92,800 company associates, is responsible for production, bottling and distribution of their products worldwide (The Coca-Cola Company, 2006-2009). This unique network of company associates plus bottling partners provides an interesting infrastructure for helping during disaster relief efforts.

9.2 Planning for disasters

Even though it is not clear through publicly available information whether Coca-Cola maintains an official plan for disaster preparedness, there is evidence of activities and initiatives focused on preparation. As mentioned in their website, they believe disaster preparedness is just as important as disaster relief. For preparation purposes, they have a partnership with the Red Cross that involves an intensive training program on first aid and disaster-relief basics conducted by the Red Cross (The Coca-Cola Company, 2006-2009). Several Coca-Cola System associates have participated and are prepared for a decentralized rapid-response deployment in emergencies.

This preparation of associates for deployment during disaster relief efforts brings up the fact that volunteerism is another way in which they get involved. The Coca-Cola website specifically mentions that they feel fortunate to be able to help those in dire need, from providing bottled water to using their delivery vehicles for aid distribution and associate volunteerism (The Coca-Cola Company, 2006-2009).

9.3 In-kind donations through pre-existing partnerships

Coca-Cola has established previous partnerships with several relief aid agencies, most notable for our case the American Red Cross. An important element to these partnerships relies on fact that the aid agency knows what it can expect from Coca-Cola, such as previously trained volunteers, water products, and distribution facilities and vehicles. Once its partner aid agencies such as the Red Cross confirm what is needed, Coca-Cola and its bottling partners

have the ability to convert their soft-drink production lines to bottle huge quantities of drinking water and use their own distribution network to deliver it to relief sites (Thomas & Fritz, 2006).

9.4 Water as a key donation product

Since water is the cornerstone product that Coca-Cola can provide during disaster relief efforts, the company has launched several other initiatives around it. They have a number of water projects involving the U.S. and other countries in initiatives such as building tanks for storing clean water, rainwater harvesting projects, well rehabilitation programs, etc. Furthermore, in partnership with the World Wildlife Fund, they work in watershed conservation projects in the Chihuahuan Desert, which covers the Texas-Mexico border, and in other rivers and streams of the southeastern United States (Reilly & Babbitt, 2006).

9.5 Coca-Cola's involvement during hurricane Katrina

During hurricane Katrina, Coca-Cola and its bottling partners shipped more than 30 million donated 8-oz. servings of filtered water and other beverages to partner relief organizations such as the American Red Cross, Department of Defense, Federal Emergency Management Agency and Mississippi Emergency Management Agency (American Beverage Association, 2006). This effort included not only the product itself, but the distribution vehicles and facilities required for the operation.

In addition to the donation of products, services and volunteers, through The Coca-Cola Foundation, the company and its bottling partners pledged more than \$5 million in cash

donations to support relief and rescue efforts in communities devastated by hurricane Katrina (American Beverage Association, 2006).

Although already involved in community rescue efforts which included its employees' communities, immediately following Katrina's destruction, officials from The Coca-Cola Bottling Company Consolidated, the local bottling partner, mobilized in the region to distribute cash to every employee and help them with information regarding insurance claims and emergency assistance. Additionally, all plants were fitted with washers and dryers available for employees and their families as well as hot shower facilities (American Beverage Association, 2006). Since no official communication plan was in place to account for the 700 employees who work at the New Orleans distribution facility, the company used Internet and media alerts to get word out to workers about its telephone hot line, offering to help with food and shelter. The company continued to pay all of its employees during the crisis (American Beverage Association, 2006).

10 Lowe's and its corporate citizenship strategy

During the disaster recovery phase rebuilding and repairing personal property faces an instant boom. Lowe's is no stranger to the fact and, as part of their corporate citizenship strategy, they have developed several programs that tackle the key necessities during a disaster's relief and recovery efforts.

10.1 Lowe's corporate snapshot

Lowe's "be a good neighbor" slogan can probably be traced back to the start of the company in 1946. They have grown from a small hardware store in North Carolina to become the second largest home improvement retailer worldwide and the seventh largest retailer in the U.S. They operate over 1,700 stores and one of their biggest customer profiles is the do-it-yourself homeowners seeking to improve the value of their properties. Since 2007 they expanded to Canada and in 2010 they opened their first store in Mexico. Today, Lowe's is a \$47.2 billion company ranked #47 on the Fortune 500 list that serves 15 million shoppers per week and employs more than 238,000 people. Their merchandise offering is comprised of 20 product categories ranging from appliances and tools, to paint, lumber and nursery products. They stock more than 40,000 products and have more than 500,000 products available via special order (Lowe's Companies, Inc, 2010). With over 1,675 stores, 32 distribution centers and millwork facilities across the U.S., Lowe's infrastructure and product offering makes it an ideal resource for disaster relief efforts.

10.2 Role-model partnership with the American Red Cross

In 1999 Lowe's revamped its community partnerships program by partnering with the American Red Cross in disaster relief and preparedness efforts. Under the National Disaster Relief partnership, Lowe's stores nationwide serve as official cash donation sites to benefit the American Red Cross relief efforts during any disaster (Lowe's Companies, Inc, 2010).

Additionally, Lowe's matches in-store contributions dollar-for-dollar up to \$250,000. The partnership also allows Lowe's to establish store credits to assist the Red Cross chapters responding to any particular disaster and Lowe's stores serve as customer donation sites post-disaster. Since this partnership started, Lowe's, its customers and employees have raised more than \$17.5 million for disaster relief (Lowe's Companies, Inc, 2008).

10.3 Operations at Lowe's Command Center

During the 2008 hurricane season, hurricanes Gustav and Ike sparked disaster relief efforts throughout the Gulf Coast. Of the 58 stores in the Hurricane Ike affected areas, 43 were open regular business hours and 14 were open under reduced hours due to mandatory curfews. Every store in the affected areas was being carefully monitored around the clock from Lowe's Command Center. The Command Center also worked to obtain the essential products residents need to recover from the storms and expedited those products to the affected stores as quickly as possible (Lowe's Companies, Inc, 2008).

Located in Wilkesboro, NC, and with a redundant location in Mooresville, NC, The Command Center is equipped with state-of-the art equipment and an expert weather team that watches weather systems that could affect stores across the country. This allows Lowe's

distribution network to anticipate and prepare for the expected increase in demand of weather-related items such as salt or shovels. The end goal of the center is to make sure Lowe's stores re-open as soon as possible so that the community they serve can get resources immediately (Ingraham, 2010).

Lowe's Command Center was started in 1989 in response to Hurricane Hugo. With its two redundant locations it makes sure all stores in danger areas have a back-up generator to continue operations, supports community evacuation shelters, and prioritizes sales of emergency response products such as generators, chainsaws, gas cans, tarps, plywood and bottled water (Absher, 2009). Thanks to the Command Center's operations, Lowe's stores are often the first community retail operation open after landfall.

Having a Command Center like the one Lowe's operates provides the infrastructure required to plan for emergency events, responds to execution needs of product flows, store and distribution center operations, coordinate internal departments and external partners, and act as a centralized communication channel for all partners. For example, during a hurricane event, Lowe's Command Center operates the Hurricane Hotline where Lowe's expert employees assist home owners on everything from temporary repairs to generator safety and mold detection (Lowe's Companies, Inc, 2004).

10.4 Storm Recovery Teams (Lowe's SRTs)

When a disaster hits a particular area where Lowe's stores operate, its employees are also affected on a personal level. Hence, Lowe's employees form what they call Storm Recovery Teams. For example, while Hurricane Katrina was making landfall, more than 500 Lowe's

employees in other parts of the southeast were mobilized and on standby to re-open Lowe's stores in the affected markets while allowing Lowe's employees in the region to attend to their own homes and personal matters (Lowe's Companies, Inc, 2005).

10.5 Lowe's Heroes

As part of their corporate citizenship portfolio of programs, Lowe's runs the Lowe's Heroes initiative. Annually, Lowe's Heroes donate more than 56,000 hours to reach homes nationwide with safety information and products. The program partners with local fire departments in special campaigns to increase fire-safety awareness and institute single-family emergency event preparedness plans (Lowe's Companies, Inc, 2004).

10.6 The Home Safety Council

Even though it is not a program primarily focused on disaster relief, Lowe's founded the non-profit organization called The Home Safety Council (HSC) in 1993. It is dedicated to promote the creation of safer American homes and prevent home injuries and accidents which are a considerable cause of death and injuries in the U.S. One of their activities during the education of families is covering disaster preparedness for individual houses (Miyaguchi & Shaw, 2009).

11 Overview of our suggested best practices framework

After having analyzed and researched the strategies employed by each of the companies included in the previous section, we now summarize and explain each of the identified best practices that comprise our final suggested framework. For this purpose we have fitted every identified best practice into one of the final 9 best practices categories. Table 2 shows a summary of the findings.

Companies	Wal-Mart	Home Depot	GSK	FedEx	Target	Coca-Cola	Lowes
Pre-existing disaster preparedness plans	X	X	X	X	X	X	X
Command structure	X	X	X		X		X
Emergency stockpiling	X	X	X	X	X	X	X
War room	X	X	X	X	X		X
Central communications portal	X		X	X		X	X
Standing partnerships	X	X	X	X	X	X	X
Use local employees' knowledge	X		X	X		X	X
Volunteer mobilization		X	X	X		X	X
Donations	X	X	X	X	X	X	X

Table 2: Final categorization of identified best practices

At a quick glance, our final framework seems to emphasize the importance of proactive planning before a disaster strikes so that a company has the right contingency plan and the right people in charge to ensure low wastage of time and resources.

11.1 Pre-existing disaster preparedness plans

Just as it is important to have business continuity plans, companies that are effective when supporting disaster response supply chains also have pre-existing plans that are immediately executed. The pre-existing plans should be as detailed as possible, including the command structure that should be activated according to disaster type and affected facilities or region.

They should also cover any particular protocols that need to be followed when interfacing with the company's relief partners.

One integral part of generating disaster preparedness plans is scenario planning. By anticipating as many types of scenarios as possible, the company will be ready to face most events with at least a basic idea of how to start and who to call. However, not everything can be planned for. As such, the idea is to often employ pre-existing plans based on their similarity to the catastrophe at hand. A plan can be used as a starting point since most disasters have similar components but can be customized to fit the needs as time progresses.

Regardless of its size, it is imperative that an organization includes all levels, all facilities and all departments in the drafting of disaster preparedness plans. As seen in Target's example, all parts of the companies are involved in one way or another within its plans. Furthermore, drafting the plans down to a local level, like GlaxoSmithKline does with its local business units, provides a good level of autonomy and flexibility.

11.2 Command structure

A clear chain of command is necessary during times of crisis. The chaotic nature of a disaster calls for decisions to be made quickly and without ambiguity. Who makes the decisions and who executes them are questions that need to be addressed as early as possible, preferably in the pre-existing preparedness plans mentioned previously. Depending on the size and resources available to a particular organization, the command structure might always be the same regardless of the active scenario; or the command structure might be different according to regional business units or the kinds of goods and services required.

One thing that is easy to overlook when designating command structures is that the locally affected facilities during a disaster might also impact the regional employees on a personal level. An employee who needs to tend to his/her family and personal property might not be the ideal person to be involved in the crisis management team. Lowe's takes this seriously and its idea of creating, training and mobilizing Storm Recovery Teams is a perfect example. The affected employees are freed to tend to their personal matters while a trained team of individuals with a clear command structure takes over the affected facilities' operations.

11.3 Emergency stockpiling

A company looking to be an effective link during a disaster supply chain should analyze its product/service mix and understand what items will be in high demand and proactively procure and store those items. Such steps will not only boost sales of those items but will also fulfill a critical product demand when it is most needed. This good logistics practice of increasing inventory to anticipate a supply/demand mismatch also has a very important place in disaster response.

As seen in The Home Depot's strategies, they know that one of the most valuable commodities after a disaster strikes are electric generators. As such, they procure these items and place them in strategic stockpiles near the disaster prone area so that these supplies can be moved in on short notice. This idea can also be extended, beyond procurement, to production. Our research on Coca-Cola shows that they have the ability to adapt their production lines to bottle increased amounts of drinking water in the production facilities near an affected region.

11.4 War room

Most companies we researched tend to have a centralized command center typically dubbed the war room. This is a proactive measure to put all the key stakeholders and subject matter experts in one room so problems can be solved quickly without getting lost in the bureaucracy of the organization and so that the active command chain structure has a centralized operating platform. We recommend a similar command center to be established by companies wishing to engage in disaster response.

The command center can have various forms. It can be as sophisticated and technologically advanced as Target's C3 which is equipped with weather forecasting equipment and experts. It can have redundant locations for safety and business continuity purposes such as Lowe's Command Center. Or it can be as simple as a regular meeting room temporarily turned into a crisis operations center. The main idea is to have key people in a single place where communications are fast and decision-making is expedited. The war room is also an ideal place to serve as the central communications portal during a crisis.

As a further recommendation, the war room should include a person in charge with the authority to make decisions without requiring further approval. It should also be manned with cross-functional teams that have some useful expertise regarding the scenario at hand. Finally, we recommend pairing with counterparts in other partner organizations such as NGOs, governmental organizations and even other companies providing relief.

11.5 Central communications portal

Technology is the backbone of most logistical operations around the world however, during disasters, when the technological infrastructure is compromised, disaster relief efforts can come to a screeching halt. Companies must have ways to communicate with their associates on the ground and might also need to have asset tracking capabilities and interfacing with trucks that are hauling supplies into the affected areas. Also, since power is usually not guaranteed in such situations, some sort of backup power and redundant internet connectivity devices are crucial.

Again, the extent of a central communications portal ranges from the sophisticated technologies employed in the previously discussed war rooms, to Lowe's Hurricane Hotline, to something as simple as a bulletin board system in a publicly available web site. A central communications portal should always take into account the possibility of losing several of the available ways of communication like internet, land lines, cell phones, two-way radios, satellite phones, etc. Thus, a central communications portal must be ready to operate with any communications channel that is necessary.

11.6 Standing partnerships

Pre-existing relationships and clear communication channels with coordinating relief agencies are a crucial success factor for private companies during disaster response. Coordinating agencies such as the U.S. Chamber of Commerce's Business Civic Leadership Center, the American Red Cross or the Salvation Army serve as a clearing house for material and service

requests during times of disaster which get forwarded to member organizations with the requested supplies.

Depending on the size and available resources of a particular organization, the recommended relief aid agencies to partner with vary. The partnership can be with a government-backed agency such as state emergency management agencies or with NGO's such as the American Red Cross. Nevertheless, both partners must discuss in detail how the partnership should work and set clear expectations.

Additionally, just as companies benchmark their financial performance and operational efficiency with their peers, benchmarking disaster response efforts from the best in the business such as Home Depot and Wal-Mart can lead to significant benefits. Standing partnerships with other companies are a good way to learn from other organizations. At the same time, companies can also review unaddressed complications during previous disaster responses and use them as learning opportunities to form their own contingency plans in the case the same scenario comes into play.

11.7 Use local employees' knowledge

Although large centralized relief agencies can be critical in disaster relief, they sometimes lack the local knowledge needed to navigate the operational and logistical challenges created by compromised infrastructure in affected areas. Companies with facilities in affected areas can leverage their associate's local knowledge to ease the process of delivering aid and can even support state and federal agencies. This allows the government agencies to consider the private

organization a trusted ally and would allow the companies' associates access to areas otherwise closed off for outside assistance.

In addition to having the right local knowledge, and as we have previously addressed with the need for pre-existing disaster preparedness plans and the forming of war rooms, companies should allow the local associates to lead with some amount of autonomy.

Otherwise, decisions might take too long moving up and down the communications channel and this would waste critical time.

11.8 Volunteer mobilization

When the news coverage of a crisis starts to play in mainstream media, people are naturally interested in learning how they can help the situation. If a company wants to be smart about its involvement in disaster relief supply chains, it should learn how to harness its own employees' will power to help in a particular disaster. Implementing programs such as Lowe's Heroes or GlaxoSmithKline's PULSE benefits everyone involved. Employees have the opportunity to get involved in a particular disaster relief effort, while the sponsoring company gets trained and willing individuals to aid in the effort.

11.9 Donations

It is always important to donate only what is needed in a particular situation. As mentioned in our literature review, research in the humanitarian relief field shows that a common problem is receiving unsolicited donations that are not helpful. Donations can be monetary like the ones that Coca-Cola and Lowe's give to their respective relief aid partners, or they can be in-kind like

the bottled drinking water that Coca-Cola distributes or the subsidized and even free emergency transportation services provided by FedEx.

If the company applies our suggested framework, after having lengthy discussions with a probable aid agency it will be clear what goods and services any particular company can offer that the partner deems necessary. Nevertheless, if there is no match for in-kind donations, monetary donations are always an option that helps by being flexible and fast enough for almost any kind of scenario.

12 Executing the framework across industries

The Humanitarian Relief Initiative (HRI) at the World Economic Forum categorizes companies that wish to get involved in disaster response into the following ten industries: logistics and transportation, engineering and construction, IT/telecommunications, healthcare, retail, food & beverage, energy, financial services, professional services and media (Humanitarian Relief Initiative, 2009). Further, the HRI outlines the disaster response capabilities relevant to each industry as seen in Figure 4.

Industry	Opportunities for Engagement	Industry	Opportunities for Engagement
Logistics & Transport	<ul style="list-style-type: none"> ▪ Warehousing and transport services ▪ Specialized logistical and transport staff: airfield specialists, warehouse managers 	Retail	<ul style="list-style-type: none"> ▪ General household items: blankets, cooking utensils, etc.
Engineering & Construction	<ul style="list-style-type: none"> ▪ Temporary and permanent infrastructure reconstruction: homes, roads, electricity generation facilities, hospitals, schools, etc. ▪ Specialized water/sanitation services: water and sanitation system development ▪ Specialized shelter, recovery, and water/sanitation-related staff: architects, civil engineers, hydrogeologists 	Food & Beverage	<ul style="list-style-type: none"> ▪ Therapeutic feeding supplies and other relevant food supplies: fortified foods, micro-nutrients, cooking supplies ▪ Agricultural support: seeds and tools ▪ Specialized recovery-related staff: agricultural engineers
IT/ Telecommunications	<ul style="list-style-type: none"> ▪ Radio and mobile phone systems ▪ Internet/connectivity systems: satellite, radio, LANs ▪ Specialized telecommunications and IT staff ▪ Specialized information systems: supply chain management software, nutritional assessment and surveillance systems 	Energy	<ul style="list-style-type: none"> ▪ Fuel: vehicle and aircraft
Healthcare	<ul style="list-style-type: none"> ▪ Medical supplies ▪ Public health education equipment ▪ Specialized medical staff: infectious disease experts, women's health practitioners 	Financial Services	<ul style="list-style-type: none"> ▪ Micro-credit: grants and loans ▪ Specialized recovery-related staff: small business advisers, credit officers
		Professional Services	<ul style="list-style-type: none"> ▪ Management and negotiation training/support ▪ Legal services ▪ Specialized management and protection-related staff: project managers, security experts, lawyers
		Media	<ul style="list-style-type: none"> ▪ Public relations services ▪ Specialized PR staff: media management experts, print and TV

Figure 4: Industry categorization (Source: Humanitarian Relief Initiative)

By merging our suggested framework of best practices with the Humanitarian Relief Initiative's industry segmentation, we propose which one of our suggested nine best practices is applicable to each industry as seen in Table 3.

	Pre-existing disaster preparedness plans	Command structure	Emergency stockpiling	War room	Central communications portal	Standing partnerships	Use local employees' knowledge	Volunteer mobilization	Donations
Logistics and Transportation	X	X	X	X	X	X	X	X	X
Engineering and construction	X	X	X	X	X	X	X	X	X
IT/Telecommunications	X	X	X	X	X	X	X	X	X
Healthcare	X	X	X		X	X	X	X	X
Retail	X	X	X	X	X	X	X	X	X
Food & Beverage	X	X	X	X	X	X	X	X	X
Energy	X	X	X	X	X	X	X	X	X
Financial Services	X	X			X	X		X	X
Professional Services	X	X			X	X		X	X
Media	X	X			X	X		X	X

Table 3: Applied framework across industries

Based on Table 3, companies in the Logistics and Transportation, Engineering and Construction, IT/Telecommunication, Retail, Food and Beverage and Energy industries should consider implementing all of the nine strategies that comprise our suggested framework. Technically, companies in all industries can do things to implement all nine strategies; however, we did not immediately identify the direct benefit and thus excluded some.

Further, it is worth noting that companies that have played a role in prior responses to disasters effectively have done so by doing what they do best. For example, GSK did not get involved in arranging for transportation of medicines rather, they provided the needed medication and did so in the most effective way possible. Similarly, FedEx, a logistics giant,

focuses on moving packages as quickly and reliably as possible both during normal business operations and disaster response. As such, it did not make sense for a healthcare company to invest in a war room or for a media company to do preventative procurement which they might donate.

Partnerships with local governments, federal government, humanitarian organizations and business consortiums is the glue that binds private companies together into a supply chain during disaster response. Without this key step, disaster response efforts performed in isolation could be futile or even hurt the operation. As such, the first step a company wishing to get involved in disaster response ought to take is partner with other organizations and have an honest dialogue about its capabilities and its shortcomings. Further, the company should also reach out to its local state emergency management office and ensure it is registered with the state. This will enable the procurement departments of those states to place orders without the lengthy supplier validation process in an emergency situation.

13 Concluding summary and comments

So far, this thesis focused on exploring what a disaster is and how disaster management works; recognizing what stakeholders participate during disaster recovery efforts. We assumed that most companies have contingencies in place for business continuity; however, most lack a strategic approach to join the relief efforts for the general population after a disaster has occurred. Furthermore, we chose a set of seven companies that are typically headlined during media coverage of disaster relief efforts and, in Table 2, extrapolated a framework of nine best practices applied successfully by them. Finally, in Table 3 we suggested how to apply the framework across a range of ten industries, identifying the strategies apply to each type of industry.

For reliability purposes, we chose seven large companies that were already involved in disaster management supply chains. Since reliability is considered “the extent to which results are consistent over time and if the results of the study can be reproduced under a similar methodology” (Joppe, 2000), we chose companies with heavy media coverage. Additionally, we made sure that the chosen companies publish their efforts in their public relations material such as corporate web site and annual social responsibility reports.

On the other hand, we decided to study each chosen company with as much detail as possible. Since “validity determines whether the research truly measures that which it was intended to measure or how truthful the research results are” (Joppe, 2000), we approached our research by trying to find primary data first. In the case of Wal-Mart, this was a presentation that was shown by Wal-Mart employees on disaster response at MIT’s Center for Transportation and Logistics. If no primary data was available, we looked journal articles, news

articles and the web in depth. We then searched the references of these articles to find more material related to our research topic. This way, we were able to obtain more information by linking multiple sources.

14 Recommendations for future research

Our suggested framework of best practices is only meant as an initial path guide for companies looking to get involved in disaster relief supply chains, particularly companies starting from scratch. Nevertheless, our research was broad-scoped regarding industry segments. Very useful insights could be gained from researching the involvement of companies in a particular segment and then creating a segment-specific framework.

Another limitation of our research is that we focused on particularly large companies with revenues in the tens of billions of dollars and employees in the tens of thousands. Even though our framework is applicable to companies of all sizes, it might be further modified with key insights taken from medium and small companies that are not included in this research.

Due to the in-depth nature of our analysis, we were not able to cover a large amount of companies in our thesis. Although the in-depth analysis was critical in formulating a basic understanding, we feel that the next logical step would be to quantitatively prove the framework by collecting strategy data on a larger subset of companies through a survey. The purpose of this survey would be to get statistics on adoption of the nine strategies mentioned earlier and also to get a peek into other practices that companies employ to help during disaster response which our analysis might have overlooked.

Additionally, our researched was particularly on the involvement of companies operating in the United States and the examples we gathered were mostly regarding disaster relief efforts triggered within the country. We realize there are very good examples worldwide that might add more best practices to our framework such as TNT's involvement with disaster relief efforts across the world.

On the other hand, within the U.S. our framework is too broad to cover any particular state's needs. We mentioned the example of Florida's efforts in partnering with companies across the state, but further good examples exist in other states. In this case, EMAC is a good source for information regarding the efforts of individual state emergency management agency.

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