Supply Chain Coordination and Collaboration in Haiti: A Case Study of The Salvation Army's Use of the UPS Trackpad®

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This teaching case is intended to document the practices of UPS and The Salvation Army and to provide a basis for classroom discussion. The information presented herein does not constitute an official recommendation for particular scenarios arising in practice.

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1. **Introduction**

Every supply chain faces challenges in delivering the right quantity and type of product to the right place at the right time. However, the circumstances faced when designing and managing the systems that deliver goods to people affected by natural disasters create additional challenges. In these scenarios, both demand and supply are highly uncertain. Response plans must be developed quickly and be able to accommodate changing conditions. Frequently, planners must deal with limited or damaged infrastructure in such systems. There are often a wide range of entities involved in these supply chains, including government, military, private, and non-governmental organizations and individuals. Such systems exhibit decentralization in decision making, because it is difficult for a single centralized decision maker to create plans when infrastructure limits communication or when there are so many parties with differing objectives and information.

Coordination and collaboration among organizations are two ways to help address the challenges faced by humanitarian supply chains. In this context, coordination is defined as the management of parallel actions in ways that increase effectiveness. These may be similar actions that are undertaken by different organizations or with different beneficiaries, or they may be different actions. Collaboration refers to different organizations working together on a common action. This case study illustrates the impact of coordination and collaboration in a specific humanitarian scenario and is organized as follows. In Section 2, we introduce the setting of the case study. Section 3 describes the coordination activities undertaken in this setting, while Section 4 details a novel collaboration that arose in this context. We describe opportunities to apply ideas from this case study to future humanitarian efforts in Section 5. Sections 6 and 7, respectively, provide closing thoughts and questions for further discussion.

2. **2010 Haiti Earthquake**

A 7.0-magnitude earthquake struck Haiti on January 12, 2010. The impact of the quake on the country was substantial. Estimates suggest that over 200,000 people were killed, while in the capital city of Port-au-Prince an estimated 28 percent of downtown buildings collapsed and an additional 33 percent required repairs [1, 2]. At least 800,000 internally displaced persons continued to live in camps nearly a year after the earthquake [5]. Estimates of the number of organizations responding to the earthquake vary widely, with hundreds or even thousands of non-governmental organizations, private companies, domestic and international government agencies, and military groups participating in relief and recovery efforts.

This case study examines coordination and collaboration in disaster response through the lens of a single camp for internally displaced persons (IDPs) in Port-au-Prince. IDP camps are settlements for individuals that have been displaced from their homes by a natural or political disaster. Individuals are referred to as internally displaced to signify that they are still within their country of residence, as opposed to displaced persons living in refugee camps in countries outside of their own. IDP camps may be planned, or they may develop spontaneously as groups of individuals congregate in available spaces. The presence of camps generally begins shortly
after the disaster and lasts into the early stages of recovery, as illustrated in Figure 1. In complex disaster situations, the duration of camps can be extended significantly.

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<th>Pre-disaster</th>
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<td>Mitigation &amp; Preparedness</td>
<td>Response</td>
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**IDP Camps**

Figure 1: Timing of internally displaced persons camps in relation to the disaster life cycle.

Following the Haiti earthquake, hundreds of IDP camps sprang up, many of which were located in and around Port-au-Prince. Camps ranged in size from a few families to tens of thousands of people [3]. The map in Figure 2 illustrates both the IDP population and the density of camp locations in and around Haiti’s capital city. Open, flat spaces such as athletic fields and parks often became large camp sites.

![IDP population map](image)

Figure 2: IDP population in the Port-au-Prince area, dated April 2010 [4]

One such example occurred in the Delmas 2 area of downtown Port-au-Prince. When the wall that divided a soccer field from property belonging to The Salvation Army crumbled in the earthquake, the entire six-block area quickly became home to about 20,000 people. The Salvation Army is a non-governmental organization that has had a presence in Haiti for 60 years;
they operated a school, clinic, and children’s home prior to the quake. In the early phases of the disaster response, The Salvation Army agreed to take on the role of camp management agency for this IDP camp. Many of the largest camps were assigned management agencies. This role includes several responsibilities:

- registering camp residents, including the number and ages of people in each household
- facilitating supply distribution
- facilitating the provision of services such as water, sanitation, and hygiene
- mitigating hazards in the camp, like flash flooding
- liaising with the camp residents’ committee
- supporting the transition to long-term housing
- coordinating with other organizations

**Figure 3: Delmas 2, Port-au-Prince camp managed by The Salvation Army**

Figures 3-5 illustrate the Delmas 2 camp managed by The Salvation Army. In the photos, the stadium seats of the soccer field are visible. The pictures also illustrate the sheer size of the camp and the conditions that made it particularly challenging to address the basic needs of the residents. Through coordination and collaboration, The Salvation Army was able to improve their response to these needs.

3. **Coordination**

In Haiti, as in many disaster response scenarios of significant scope, one of the principle means of coordination is through the United Nations cluster system. This system, introduced in 2005 [6], divides humanitarian response actions into several categories or “clusters”. These include
agriculture, camp coordination and camp management, early recovery, education, emergency shelter, emergency telecommunications, health, logistics, nutrition, protection, and water, sanitation, and hygiene [7]. Each cluster is led by a designated organization, most often a UN agency. The goals of the cluster system are to ensure sufficient global capacity, ensure predictable leadership in all main response sectors, build upon the concept of partnership, strengthen accountability, and improve strategic field-level coordination and prioritization. To this end, organizations involved in different areas of a particular response effort are encouraged to attend cluster meetings to share information, coordinate activities when doing so makes sense, and communicate needs that have been identified but unmet.

Figure 4: Delmas 2, Port-au-Prince camp managed by The Salvation Army

Figure 5: Children and Salvation Army personnel in Delmas 2, Port-au-Prince camp
Camp management agencies, such as The Salvation Army, have been involved in several clusters in the Haiti response, especially camp coordination and camp management, education, emergency shelter, nutrition, protection, and water, sanitation, and hygiene. The coordination made possible by participating in these clusters resulted in direct positive impacts on the services provided to residents in the Delmas 2 camp. For example, the water, sanitation, and hygiene services in the camp were provided by Concern Worldwide, another non-governmental organization. UNICEF (United Nations Children’s Fund) organized child-friendly spaces in the camp, where children learn, play, and interact. The Salvation Army shared the information gathered during their registration of camp residents with the UN agencies responsible for allocating food and other relief items, ensuring that the camp received adequate supplies for distribution.

4. Collaboration

A unique collaboration proved to be key to improving operations in the IDP camp managed by The Salvation Army. While registering camp residents was useful in providing the most appropriate services and was required for any camp management agency wishing to receive UN-coordinated relief items to distribute to its residents, the registration process was one of the most time- and resource-intensive tasks faced by camp management agencies. The Salvation Army, like other agencies, initially registered camp residents using a paper system. Information about resident families was logged on paper forms and then entered into a computer database by Salvation Army personnel. Each family in the camp received a paper registration card documenting their residence in the camp. Personnel from the Salvation Army estimated that this initial registration process took two weeks for the camp of about 4000 families. During supply distributions, residents presented their paper cards to receive food, tarps, or other items. This paper system presented a challenge in documenting what residents received. “One person had the idea that we would stamp off…we would have a food column or a shelter column and we’d stamp those off, but you can capture so little data in that environment and once you lose it, it’s gone,” reported a Salvation Army volunteer. In addition to the limited room for recording information, the cards were easily damaged, lost, or stolen, leading to a recurring need to replace them.

The Salvation Army personnel were thus eager to find a better solution for the registration and distribution process. One of the first volunteers on the ground in Haiti, a long-time volunteer with the organization who had made several trips to the country before, is also a UPS employee. He was familiar with the company’s Trackpad® system and thought that this could be an efficient solution to the challenge of registering and distributing relief items to families in the camp. The main component of the Trackpad® system is a handheld scanner, which is capable of reading barcodes as well as capturing and storing data via keypad inputs. The scanner is used together with a laptop for storing the data. The system is typically used for tracking packages in a campus environment. Communication with UPS colleagues led to a collaborative effort to implement the Trackpad® system in the camp in Port-au-Prince. A UPS employee customized the system’s 10 data fields based on input from Salvation Army personnel, and a UPS supplier printed customized plastic cards with barcodes. Each family in the camp was given a card, and the name, camp location, number of family members and ages, and a photo of the head of
Both data management and supply distribution were greatly improved through the use of the Trackpad® system. The durability of the plastic cards eliminated the need to regularly replace all cards. Moreover, even if the plastic card was lost, the data associated with it was not. Much more data can be stored for each family using the electronic system, as well, without the need to enter data by hand from paper records into a computer system. The Salvation Army Disaster Services Director pointed out, “Really, it doesn’t just speed up the distribution process, there’s also a couple other factors. One, I think it gives us a lot more demographic information, more detailed and a lot sooner, which helps us to know who we’re serving [and] what their needs might be.” The electronic system enabled Salvation Army to establish a record of services provided and of families served, and these records also made it easier for Salvation Army to report activities to UN clusters and communicate relevant data with response partners. The camp manager described the reaction of other organizations to the level of information that Trackpad® made possible: “[…] people are stunned because they talk to us and we say, we’ve done this, we’ve got [this] many people and we know the family size is 4.9. And when they ask how we know, it’s not because we’re smart, it’s because we’ve got these.”
The system provided other benefits, as well. Camp residents felt a sense of status and ownership associated with having a card. Distributions were more orderly after Trackpad® system was implemented, as reported by Salvation Army personnel: “... the crowd got a lot more peaceful. Everyone knew if my card doesn’t scan, I’m not getting anything anyway, so there’s no reason to fight and get in the line.” As shown in Figure 7, distributions involve camp residents lining up to await their turn to receive supplies. With the new electronic system, distributions could be done on a schedule, with cardholders of certain numbers being served at different times. This reduced the time families had to wait in line, which was especially important given the hot conditions. Once a card had been scanned for a particular distribution, an attempt to scan it again would produce an error. This served to prevent fraud during supply distributions. In addition, the electronic system automatically documented which families received supplies; this allowed camp officials to follow-up with families that missed distributions.

5. Future Opportunities

Conversations with The Salvation Army, UPS, and numerous non-governmental organizations and UN agencies helped identify many opportunities to expand the use and impact of technologies like the Trackpad® in the humanitarian relief context. Within the scope of managing a single IDP camp, The Salvation Army indicated that the capability to generate sub-lists to manage specific distributions, such as items intended specifically for pregnant or lactating women, would be beneficial. While they currently associate a photo of the head-of-household with each card, capturing pictures of all family members may further reduce chances of corruption in the system. In contexts when multiple scanners are being used, such as during a supply distribution, the ability of scanners to communicate with each other could also be valuable. The potential future applications of an electronic registration and distribution system...
extend beyond a single camp, however. Expanding the system to other camp management agencies would facilitate data sharing and enable more accurate tracking of the population being served. A common system could increase the impact of limited resources by providing more accurate demand estimates and by preventing individuals from registering in multiple camps.

A system like the Trackpad® has the potential to improve other humanitarian efforts beyond camp management, as identified by many of the agencies active in Haiti. As families move to permanent shelter, the GPS-ready device could be used to capture their new location to facilitate future deliveries of supplies or health check-ups. Such a system could be used to facilitate long-term provision of community services, such as health or education, throughout and beyond the recovery. The electronic system can simplify the process of analyzing response efforts and community services and facilitate improved demand forecasting and inventory management. One of the greatest challenges for many humanitarian organizations is documenting the last mile of distribution. Scanning a card at the time a beneficiary receives a product or service provides that documentation, and the electronic system closes the loop between demand estimation and last-mile patterns of use.

These future opportunities also raise important questions about implementation. For instance, what are the best ways to allocate the costs and benefits of an electronic system to encourage broad adoption among humanitarian responders? How should a supply chain be configured to make use of technology to close the loop between demand estimation and last-mile distribution? These and many other supply chain questions are relevant not only for disaster response planning, but also for any organization faced with supply chain management under the threat of disruption or uncertainty.

6. Conclusions

This case study documents the positive impact of both coordination and collaboration on a particular camp for internally displaced persons in Port-au-Prince following the January 2010 Haiti earthquake. Critical to the success of these efforts were the UN cluster system, the complementary expertise of collaborating organizations, and a novel application of existing technology. As described, this example has the potential to lead to other substantial advances in humanitarian efforts by expanding the application of the Trackpad® or similar tools. This scenario also points to many of the challenges faced in any supply chain disruption, as well as the opportunity to address these challenges through coordination and collaboration.
7. Discussion Questions

1. Delivering needed supplies and services in the aftermath of a disaster requires many different organizations. In what ways are these supply chains similar to commercial supply chains? Different?
2. This case study described successful examples of coordination and collaboration. What challenges must be overcome by organizations that wish to coordinate or collaborate in this sector?
3. Describe a scenario in which coordination or collaboration may be undesirable to an organization. What changes might make coordination or collaboration more appealing and/or feasible in that case?
4. Suppose you are a leader of a non-governmental organization that has been tasked with managing a camp for internally displaced persons. You must implement a process to register all of the families in your camp, and you can do this using a paper system or an electronic barcode system such as the Trackpad®. What data do you need to determine which choice is more cost-efficient for your organization?

8. References