The IBM Response to Typhoon Haiyan

Helping the Philippines improve disaster planning and response
The crisis
Situated both on the ring of fire and directly in the path of hurricanes that develop off the coast of South America, the Philippines, a chain of 7,000 islands, is no stranger to disaster. But when Typhoon Haiyan hit in November, 2013, it was unlike any storm the nation had ever experienced. Although the Philippines had several days to prepare for the typhoon's landfall, and the Philippine Government has a great deal of experience in coping with the country's frequently occurring natural disasters and extreme weather, the size and speed of Haiyan made this storm's impact much greater. The Philippine government followed their standard disaster preparation protocol and pre-positioned food for 500,000 people, and by the evening of November 7th, the Philippine Atmospheric Geophysical and Astronomical Services Administration (PAGASA) had issued warnings to 60 of the 80 Philippine provinces and the government had relocated 500,000 people away from particularly vulnerable areas where the hurricane was expected to come ashore.

The hurricane hit with unimaginable force. With sustained winds of 195 miles per hour and gusts to 235 miles per hour, Typhoon Haiyan remains the strongest storm ever recorded at the time of landfall. Although wind speeds were extreme, the major cause of damage and loss of life was due to storm surge. Most of the major devastation that took place was on the east coast of the islands of Samar and Leyte, with a particular focus on Tacloban due to its location at the northern end of San Pedro and San Pablo Bay and with a large population in low-lying areas. According to the United Nations, more than 670,000 people were displaced by the storm and nearly 12 percent of the country's population was directly affected.

A rapid response from IBM
IBM has a long history of helping when disaster strikes — and whether a crisis is triggered by a flood, an earthquake, or the driving wind and rain from a typhoon, we believe that combining innovative technology with talented people on the ground can speed-up recovery efforts. Days before Typhoon Haiyan made landfall, our Corporate Citizenship & Corporate Affairs team in the Philippines began engaging local and global experts within the company to help ready the assistance we knew the country would require. IBMers then reached out to our client and community partners to assess and strategize on ways those IBM capabilities and solutions could help.

In the typhoon’s aftermath — with most of the critical infrastructure and many remote low-lying villages in the impacted region destroyed — one of the biggest challenges the Philippines faced was the lack of ready channels of communication among disaster responders. Without adequate communications systems in place, government agencies struggled to collect, collate, verify and act on information from the field-level response teams. Without the ability to gather real-time, situational data, the government had difficulty supporting an effective response and providing verified situational reporting to external agencies and the public.

The problem was further compounded by the fact that historically, traditional emergency response processes are built on a hierarchical approach with each agency using its own operational methods. The Philippines was no exception. In addition, with this model, most agencies typically develop their own way of gathering, storing and sharing data — as well as building their own expertise, best practices and information. Without new technology, such as the IOC for emergency management, it’s challenging for organizations to easily share data and develop new models for how they work together.

By mid-November, the Philippines government expressed a growing need for better situational awareness and decision making capabilities and for a more centralized command center approach. From the IBM perspective, this was a classic business problem: the need to consolidate the information flow and provide reliable, integrated communications — in this case, to serve disaster management agencies. The ability to deliver situational awareness would allow all disaster management agencies — from the most senior level of the Philippine Government to key tactical field-response groups — to better carry out their disaster response activities.
The Intelligent Operations Center for Emergency Management
Within two weeks of the typhoon, we proposed an IBM Impact Grant of technology and services to the Philippines Department of Science and Technology (DOST), and immediately began executing. As part of the grant, IBM began to put in place an IBM Intelligent Operations Center, a robust platform of hardware, software, and analytics. The solution incorporated software called Touch Assisted Command and Control System, or TACCS™, from IBM Business Partner Priority 5 Holdings, Inc., technology which allows analysts to simulate “what if” scenarios using known assets—for instance, different types of infrastructure, people, resources and geographic settings which are already available via the IOC system. The TACCS software can help identify potential vulnerabilities or risks in those assets, and can be used for early warning alerts as well as for emergency response planning. This type of tactical field analysis coupled with the IOC situational awareness and analytics reporting can then be shared in a common view among any stakeholder government agencies, including, in this case, the National Disaster Risk Reduction and Management Council, the lead government agency responding to natural disasters in the Philippines.

IBM Intelligent Operations Center for emergency management

The devastating typhoon that hit the Philippines in 2013 brought into focus the immediate need to mitigate risks during disasters and better respond when they occur. IBM awarded an Impact Grant to the Philippine government to help better manage disaster response and recovery by capturing data from multiple sources into a common view that provides a central point of command.

IBM’s Emergency Management Center solution provides:

- Decision makers with real time information across multiple stakeholders
- A common operating picture and true situational awareness to disparate organizations
- Fused knowledge of operational status with the ability to perform consequence analysis
By pulling data from disparate sources—including from government sources, websites, universities, and other public repositories—into a common, secured view, the solution provides users with a comprehensive vantage point for understanding and decision making. The system currently addresses two use cases: providing emergency managers with critical information such as advance warning for extreme weather events; and situational awareness that can include feedback from first responders on the number of casualties and affected families, condition of buildings, roads, and infrastructure. The distributed data sources feed into the system’s analytics and scenario planning capabilities to help the government better anticipate and plan response and recovery operations in a shared platform that communicates readiness when threats are present and situational awareness as a disaster unfolds.

IBM Business Partner UnifiedEdge, Inc., also joined in the IBM recovery efforts in the first two weeks, as we began deployment of our Integrated Communications System, which included IBM Sametime and servers as well as UnifiedEdge technology known as RadioConnect™ for Sametime. This technology enables cross-radio frequency communications—a Radio-over-IP environment, which is similar to Voice-over-IP but supports radio instead of voice communications—in order to improve communications for first responders and emergency relief providers. Field operators have real-time push-to-talk voice communications with the Command Center and with each other using disparate 2-way radio systems, smart phones on mobile data networks, and workstations using satellite uplinks.

Experts from across the business got involved. The global, cross-functional team consisted of dozens of consultants, architects, developers, program managers, researchers, and specialists in disaster and resiliency. The global enterprise was able to deliver and grow deep expertise locally in the Philippines and from locations around the world, whatever was needed to plan, design, implement, and support the solution.

---

1. Extreme weather is predicted.
2. Situational awareness engines monitor weather feeds in the Intelligent Operations Center.
3. Rules engines start automated responses via SOPs.
4. The Intelligent Operations Center initiates the most appropriate response based on situational awareness and incident information.

Emergency Shelter
Initial results
On May 29, 2014, the Philippine government hosted a ceremony to officially launch the IOC for emergency management, which was fully operational. A real-life case—the approach of tropical depression Domeng (Peipah)—was an opportunity for the team to identify scenarios for planning based on numerous projected storm tracks. Using data from Project NOAH—the Nationwide Operational Assessment of Hazards, which provides research in natural disaster risk mitigation in the Philippines—the team was able to quickly assess locations at greatest risk.

IBM's humanitarian disaster efforts place particular focus on the longer-term recovery efforts, where tools can be most effective in building stronger and more prepared communities. We have done business in the Philippines since 1937, and we continue to work with the Philippines government to address their need for better decision-making support. As part of this commitment, the IBM grant comes with two years of help desk support, and included an additional IBM transition support team that remained on site for six months after the system was operational to help train DOST staff, help the government continue to maintain the expertise needed to maximize the power of the Intelligent Operations Center for emergency management, and at the same time, provide a starting point to better manage future responses.

As part of our overall strategy to look for ways to help throughout at all stages of disaster response including long term recovery and preparedness, the Philippine Disaster Recovery Foundation (PDRF) received an additional IBM Impact Grant that included two separate focus areas: a donation of IBM Connections technology and consulting, and a Disaster Readiness for Nonprofits Workshop to help the individual PDRF members develop their own continuity plans and/or enhance any existing plans they already had in place. IBM also made a grant to the Philippine Department of Education, of 60 KidSmart Early Learning Systems, along with teacher training, to support recovery efforts in the province of Leyte. Finally, IBM awarded a grant of consulting services to the American Red Cross International Services department, which was involved in supporting Haiyan response activities. The grant helped the American Red Cross think through strategies for leveraging cloud-based tools for disaster information management following international crises.

An on-going partnership with the Philippines
For years, IBM has recognized how vulnerable the Philippines is to natural disaster, and has worked with the Philippine government to help mitigate these risks and better respond when disasters do occur. In 2006, following landslides in Southern Leyte, we worked closely with the government to customize and deploy Sahana, an open source disaster management application owned by the Sahana Software Foundation, to help in reuniting families and tracking needed supplies. The Philippines has hosted a dozen IBM Corporate Service Corps teams, three of which have focused specifically on disaster preparedness. These activities and partnerships created a foundation, before Haiyan, that clearly demonstrated our corporate commitment to assist at all phases of disaster including preparedness.

The Intelligent Operations Center was put through its paces in December, 2014 when yet another tropical storm, Haguput, hit the Philippines. This is yet another example the ongoing relationship between IBM and the Philippines. After working closely for so many years, the foundation existed enabled us to join forces to deploy a complex, robust solution that will serve the country and continue to build value as more agencies come on over time, as well as to ultimately save lives.
“IBM’s Impact Grant to the Philippine Government demonstrates our corporate commitment to providing innovative technology that can assist at all phases of disaster—from preparedness to long-term recovery. This grant enables experts on the ground to get the information they need to make the best decisions about managing emergency situations in ways that complement rather than compete with existing efforts.”

— Stanley S. Litow, IBM Vice President, Corporate Citizenship & Corporate Affairs and President, IBM Foundation

For more information
For more information about the disaster response work done by IBM in the Philippines and around the world, visit:
ibm.com/responsibility

For more information about IBM Impact Grants, please e-mail ibmgrant@us.ibm.com or contact your local IBM Corporate Citizenship & Corporate Affairs representative.

Reference

1 “Was Typhoon Haiyan a Record Storm?,” Scientific American. blogs.scientificamerican.com/observations/2013/11/12/was-typhoon-haiyan-a-record-storm