Welcome
The Tech for Global Good Design Challenge

Cebu City, Philippines

Tuesday, March 13
The Tech for Global Good
The Tech for Global Good is a new initiative that will create the next generation of innovators ready to tackle the toughest challenges facing our planet.

 PATH
What is PATH?
PATH is the leader in global health innovation. An international nonprofit organization, they save lives and improve health, especially among women and children.

Design Process
1. Research the problem:
   - Understand the design challenge.
   - Read the background material.

2. Brainstorming:
   - Write each idea (text/image/both) on a Post-it note and put it on the whiteboard.
   - Be creative! Think of as many wild thoughts as possible.

3. Create a solution:
   - Each member shares their Post-its and posts them on the board.
   - Pick someone to group similar ideas.
   - Label the categories.
   - Team reporter summarizes the categories to the team.

4. Refine your solution:
   - Get feedback from peers on your solution.
   - Edit your solution and improve how it addresses the problems.

5. Design a poster presentation:
   - Get feedback from peers on your solution.
   - Please show:
     - The vaccination problem your team has addressed.
     - Your team’s solution.
     - Story of how someone in the city is impacted by your solution.

Design challenge
You and your team run a pharmaceutical company in San Jose that has developed, tested and produced a vaccine that can prevent a deadly disease. Your team will use your skills as communicators, researchers, collaborators and creative problem-solvers to assist the city governments in developing plans to help immunize their communities.
Designing a solution with Cebu City, Philippines

The city of Cebu City has reached out to your pharmaceutical company for help with their current immunization crisis.

Problem

Your pharmaceutical company has helped develop and ship 200,000 vaccines for measles to Cebu City, Philippines. Now your team needs a plan that keeps these vaccines the right temperature and gets them distributed and stored in the rural communities outside of Cebu City.

Your pharmaceutical team will need to create a poster to show your solution and how it will impact one person (a child, a parent, a healthcare worker, etc.) in a community near Cebu City. The following provides some information that might be useful to your team while you work on your solution and story of how a person in this community is affected by your solution.

About Cebu City

Cebu City is a busy port town with a long history. Today there are 922,611 people living within the city limits. This is between the population of San Jose (1 million) and San Francisco (800,000). Cebu City is the main domestic port in the Philippines with over 2 miles of the coast available for docking ships. This city is very busy with international and local boats dropping off and picking up goods. However, this is not the only way to get in and out of Cebu City. There is an international airport 9.5 miles away. Getting around the area can be achieved with buses, ferries and jeepneys.

In November 2013, Typhoon Haiyan hit the Philippines. It was one of the deadliest ever recorded in this region and took out electricity throughout the Philippines. In 2017, there are still electrical issues related to the damage from this storm. This includes rolling brownouts, which are times when part or all of the electricity in an area goes out for periods of time from a few minutes to a few hours.

There are challenges to getting immunizations for people who do not live near the city. Many of the clinics and supplies are located in major cities, like Cebu City, and communication is provided locally or electronically about where to get immunizations. However, for people in rural communities medications and immunizations are difficult to access. Travel to the city can be costly in fare and lost wages. Waiting for vaccinations to come to one's rural community can take time, since the delivery pattern is unpredictable and it is difficult to keep the vaccines at the correct temperature during transport.
When there are storms like Typhoon Haiyan that destroy buildings, ships and the electrical grid the need for vaccines and medicines increases. The damage to infrastructure like storage, transportation and clinics makes getting vaccinations in rural communities even harder. City and country governments often work with nonprofit and international agencies to develop plans to help these areas in case of an emergency.

**Cold storage challenges in Cebu City and the Philippines**

Immunizations need to be kept very specific temperatures to preserve their effectiveness. One immunization that helps protect against measles is called the MMR. MMR is shipped in two different sets of vials; one has the undiluted vaccine and the other has the diluent. The diluent can be stored at room temperature, but it cannot be frozen. The undiluted vaccine can be stored between -58°F and 46°F. Any colder or warmer will damage the vaccine and make it less effective. Also, the vaccine must be protected from light at all times, since such exposure may make the vaccine not work at all.

To use the vaccine the undiluted vaccine vial and the diluent need to be combined. The temperature of the vaccine must be between 36°F to 46°F to do this. It is recommended that the vaccine be used as soon as possible after combining the vials. The combined vaccine vial should be stored in a dark place at 36°F to 46°F and discarded if not used within 8 hours.

The challenge in Cebu City is that there needs to be ways to store and transport the vaccines while keeping both vials at the correct temperatures. Given that the area has earthquakes, typhoons and some brownouts there needs to be a plan for storing and delivering vaccines where they are needed. To achieve this there can be a combination of approaches in protecting vaccines using:

- Temperature monitoring vaccine carriers that can run 8 to 65 hours between electrical charges, but they can only hold a few boxes (100 vaccines).
- Backup generators at hospitals can be expensive to maintain, but can supply electricity during a power outage as long as there is enough fuel to keep them running.
- Ice-lined refrigerators can maintain their temperatures for up to 31 hours without electricity.
- Solar-powered refrigerators need 3.5 kWh/m2/day of sunlight to power the freezer for 85 to 135 hours.

**From your reading**

**What information is important to share?**

- [ ]
- [ ]
- [ ]
- [ ]

**What questions do you have based on what you've read?**

- [ ]
- [ ]
- [ ]
- [ ]
Brainstorm notes

Problem
• How will you share your solution with different communities within your city?
• How will you let people know about your vaccine?
• How will you distribute your vaccine to people who do not regularly see a doctor?

Solution
• What are some really wild, unusual ideas that you might try?
• If you had unlimited resources, what would you do to solve this problem?
• What are other ways to solve this problem? What are the pros and cons of these solutions?

Impact
• How does this solution impact the vaccine user (patient)?
• How does this solution impact healthcare workers?
• How does this solution impact the family of the patient?
Listen and help

**STEP 1**
- **Team A presents their design solution**
  - Team B cannot speak
  - Team B can take notes
- **Team B writes questions.**
  - Quiet minute for thinking.
- **Team B asks clarifying questions**
  - Team A can answer
  - Team A can take notes
- **Team B provides feedback**
  - Team A should take notes

**STEP 2**
- **Team B presents their design solution**
  - Team A cannot speak
  - Team A can take notes
- **Team A writes questions.**
  - Quiet minute of thinking.
- **Team A asks clarifying questions**
  - Team B can answer
  - Team B can take notes
- **Team A provides feedback**
  - Team B should take notes

Listen and help notes

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Poster ideas and sketches