Drop Access: How a Woman-Led Startup Is Ensuring Access to Equitable Healthcare Through VacciBox

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NEWS RELEASE BY **CISCO SYSTEMS INC.**

Northampton, MA | August 30, 2022 11:15 AM Eastern Daylight Time
Now that the **Cisco Global Problem Solver Challenge** 2022 winners have been **officially announced**, you'll want to learn more about each winning team and the story behind each innovation. The Cisco Global Problem Solver Challenge is an online competition that awards cash prizes to early-stage tech entrepreneurs solving the world's toughest problems. Since 2017, the competition has awarded $3.25 million USD to 78 startups from 25 countries.

We are excited for you to learn more about the 2022 winning teams addressing some of the biggest challenges we face through technology-based solutions.

We will start with **Drop Access**, a team in Kenya that was awarded the Grand Prize of $250,000 USD. Their winning solution, VacciBox, is a portable, low-cost solar-powered fridge for use in healthcare facilities that don't have a reliable cold chain to store vaccines.

CEO and co-founder Norah Magero and CTO and co-founder James Mulatya are both mechanical engineers by training who met at the University of Nairobi, Kenya. With a passion for helping others, their solution has more than tripled vaccination rates at a rural health care center in Kenya. I sat down with Norah and James to learn more about their story, motivation, and innovative concept.

What problem is your technology solution trying to solve?

Norah: Globally, 3 billion people are at the risk of contracting a Vaccine Preventable Disease because their healthcare facility does not have a cold chain to store vaccines.

Our solution is bridging a gap in the rural healthcare sector by ensuring that heat-sensitive items, such as vaccines, blood for transfusion, and drugs like insulin, have the appropriate cold storage to ensure every single person has access to equitable healthcare.

VacciBox is lengthening the shelf life of heat-sensitive medical items so everyone can access these essential medications and medical services irrespective of where they live.

VacciBox is also broadening the geographical reach of these healthcare items. Our solution ensures these medical items are also available to people who cannot access healthcare facilities. For us, we must integrate portability into trying to solve the issue of inaccessibility of medical items.

Can you explain how the solution works?

Norah: Although refrigeration is not new, the beauty of VacciBox is that it's a portable fridge. It can remain in operation, even when mounted on a motorbike, a bicycle, a boat, a wheelbarrow, a cart, or even carried. We're ensuring that as vaccines or other medical items are being transported from one point to another by various modes of transport, they are still being kept in the best cold storage condition.

Our solution is also solar-powered, which is important because the target communities that benefit from VacciBox are in off-grid places with intermittent power. Solar is also a more affordable option. VacciBox also has a built-in battery backup because we must ensure that the fridge remains in operation at night.

The most exciting thing for us about VacciBox is the Internet of Things (IoT) solution. We had to integrate it with a smart data management application. Wherever the fridge goes, it can record the temperature in real time and transmit it back to us. We need to have the ability to track this data because, in local health care facilities in Kenya, they still record data in books, then it's taken to a governmental agency known as the District Public Health Nurse (DPHN) at the end of the month. If a fridge had a temperature excursion at the beginning of the month, the DPHN will only be aware of this at the end of the month, and it is too late to take action.

We try to ensure that the VacciBox is monitored at all times, so the data is up-to-date, and data-driven solutions are in action to ensure that no vaccines go bad. If the temperature exceeds what is expected, VacciBox sounds an alarm, and that temperature is recorded. If it's too low, that is also recorded, so we know to adjust appropriately and ensure that the vaccines remain in appropriate cold storage as much as possible. The IoT solution for the fridge eventually morphed into an AI-enabled solution that we want to integrate into VacciBox because we ultimately want to distribute the fridges into far-off places.

What is innovative about the way you are solving the issue? What sets your solution apart?

James: We are a young team, and being open to new ideas has helped us develop the solution. Initially, we started thinking about portable fridges for dairy farmers. Then COVID happened, and we pivoted because we saw a need for a solution like this in

healthcare. We initially imported a generic fridge and took it to the field to get feedback from healthcare workers.

What has been innovative about our approach is that the development of VacciBox is guided by feedback we've gotten from healthcare workers. We decided to add the IoT feature because we heard from the healthcare workers that it was challenging to manage and ensure the accuracy of the data they were writing in books. Working directly with healthcare workers is very important because they are the users of this solution and have experience in the field, so they know what type of solution works best for them.

Norah: How we want to provide full after-sales support sets our solution apart. As the manufacturer, we are responsible for ensuring that these fridges remain operational all year and over the next three years. So, it's good for us to have sufficient data for predictive maintenance. For example, if we try to see that fridge X is at a particular facility and seems to be heating up quickly, maybe the insulation is wearing out. We need to start planning how to repair our fridges to avoid discarding them for problems we can fix. It becomes a menace to the environment when fridges go into a landfill and become e-waste. It's also a waste of money because cold storage is so expensive. So, if you can do predictive maintenance, it will be cheaper for the end user.

What inspired you to develop this solution?

Norah: As a mom who moved from Nairobi to a rural community, I have faced the challenges of trying to have my child vaccinated. When I lived in Nairobi, I never thought twice about access to vaccines or certain medications because they were available. You become oblivious to the challenges in communities that do not have access. I moved to a rural community right after my daughter was born, and that was when the challenge became real. Vaccines are not always available. There are specific times and days for vaccinations; if you miss that day, it's a missed opportunity. And I saw mothers who gave up because they walked a long distance to get vaccinated. Or sometimes, they don't have the finances to travel back to the facility.

Given all the circumstances, it was apparent that we needed to design a fridge for medical use in rural communities in Africa. Health care workers carry vaccines in an ice box on their motorbikes or bicycles and take them to facilities. But the cold box is not a refrigerator, and sometimes the temperature can fall outside the desired range and there is no way of monitoring this, so it's not safe. So, we had to design a portable solution available for different modes of transportation and keep items in storage while in motion. We also had to ensure that all children and adults get a chance to get a vaccine.

How will winning a prize in the Cisco Global Problem Solver Challenge help you advance your business?

James: For us, it is honestly life-changing. We want to grow our business and we find that most of our roadblocks are financial. A challenge with the current state of manufacturing for the fridges is that we are outsourcing a lot of production, making it more expensive. When we started this project, we wanted to provide not only an effective solution but also an affordable one. So one of the first things we want to do is set up our own manufacturing facility so we can produce these fridges in-house. And that will drastically reduce the cost of VacciBox and make them more accessible. This prize will give us a unique opportunity to break into the domestic market. We've seen considerable demand, and customers have approached us from other countries across Africa, including Malawi, Mozambique, and Zimbabwe. Having the funds to produce this at scale will help us match the growing demand for the solution and create as much impact as possible.

Norah: As CEO, I'm glad we can hire more team members to help us do this work because it's been our dream, and we've done so much work in the past few years. When we started this work, there was skepticism about manufacturing these fridges in Kenya. Just being recognized and awarded by Cisco is a confidence boost for us. It's always hard on entrepreneurs trying to bring innovation into the world. With the stamp of approval from Cisco and the knowledge that Cisco believes in us and our work, we'll stop listening to naysayers because we have so much support.

Do you know what you will use the prize money for specifically?

Norah: We want to increase our production capacity, acquire more tools for our manufacturing facility, and get our own facility. The money from Cisco will give us so much runway to sustain that manufacturing facility and complete our work and make enough fridges for the growing list of potential customers. We also want to grow our IoT solution this year; it's still a work in progress. Many challenges that we're facing are expensive challenges. Some of our goals are to get the right people and the right equipment and to ensure that the IoT solution is always online and working.

What advice do you have for other social entrepreneurs?

James: My advice is to never give up. With the work we've done so far, there have been many opportunities for us to give up and walk away. But I think the passion behind it has kept us going because we believe we have a good solution and have to see it through. Do something you are passionate about because that will push you through those hard times.

Norah: Personally, for me, it is advice to women. This landscape is tough, but I can tell them that there are so many people out there who support women. I have learned not to give up by reflecting on why I do this, which keeps me going. If you put in the right amount of effort and keep pushing, you can bring your venture to light. There are not

enough women in this industry, so I'd like to see more women rising up with their technologies, bringing them to market, and seeing more women impacting this space. I want to see more female-led organizations because we can build a support system and get more women to join the tech startup space. Remember that every single person who is an expert was once a beginner.

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