Stanford eCorner

Strategies to Fight Disaster [Entire Talk]

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01-05-2019

URL: https://ecorner.stanford.edu/video/strategies-to-fight-disaster-entire-talk/

Nicole Hu and her two co-founders created One Concern to help communities prepare for and mitigate natural disasters by harnessing the power of AI. She explains how they use machine intelligence as a predictive tool, and shares strategies for identifying a central problem, securing investment and growing a mission-driven team.

Transcript

(techno music) - [Narrator] Who you are defines how you build.. - Stanford's not just special to me because I'm an alumni here, but also because we started One Concern right here four years ago.. It was here where I met Tim and Ahmad, my co-founders, where we eventually became friends.. And we became friends because we shared common values.. If you've gone through a demographics for the co-founders, we are very different.. I'm an Asian woman, Ahmad's Muslim Indian, and Tim's a Caucasian, from the military.. But we had fun at Stanford, always talking about large problems and just really getting to know each other.. Now one fine summer of 2014, Ahmad went back home to Kashmir, and I'm not sure if you know about this, but Kashmir, India had one of the largest floods that year, a flood which they hadn't seen in several decades.. We tried very frantically to reach out to him.. We would see the news talking about how many hundreds of people ended up losing their lives, and we couldn't reach out, we couldn't connect with him, and it was very, very scary..

Ultimately, we did end up connecting with him to figure out that his family and him were safe after the flood.. However, when he came back to Stanford, he talked about so many stories related to the Kashmir flood, and it was pretty mortifying.. It was a disaster in all sense.. There's was complete chaos after the disaster.. You would have no sense for the emergency rescue to figure out where they should actually go, who should they actually rescue.. You had thousands of people abandoned on the rooftops for several days, and you have hundreds of people either drowning or being washed away by the flood.. And we wondered why is this still a problem? And in the 21st century, why is nobody thinking about it? And what can we do to help, just being graduate students here? A little while later, we got the opportunity to work in a class project together.. It was the machine learning project at Stanford, as well as the probabilistic earthquake engineering class at Stanford.. And we took that opportunity to figure out, can we actually solve that problem we saw in the summer of 2014? And what can we do to reduce that chaos? The goal there was just, you know, let's find a way to figure out what exactly the problem was.. And the problem we tried to resolve was, can you provide a real-time granular understanding of which buildings and which people are in what state of collapse during a disaster? So that was our problem statement..

Our backgrounds of computer science, structural engineering, and earthquake engineering led to it being focused mostly on seismic, initially.. And we were really happy with the results, it was surprising, 'cause it wasn't done before.. But there's a lot of physics and science already there in structural and earthquake engineering.. All we did was sort of understand the features present there, and really convert that in a more granular and real-time solution.. We're happy with the algorithm we created, but what even more pleasantly surprised was that when we presented this algorithm in the CS229 Machine Learning Fair, a lot of professors came up to us, a lot of investors came up to us, and said that what you have is applicable and you can create a real product here.. Now, we were taken a little aback, 'cause we never thought of starting a company, or of creating a product, and none of us had experience running a business before.. 2/3 of us were immigrants, myself and Ahmad, and I'm not sure whether it's a similar thought process, but when you're an immigrant, generally you come to Stanford, you know, your thought process is work hard, study hard, get good grades, and then find a reputable place to go to so that you can then give back to your family who sacrificed so much to just make sure that you come here.. So when somebody came up to us and said you should not think about the idea this way, think about what a product could look like, it was a little hard for us, because that meant that there's obviously going to be this associated with creating a company, and we didn't have any background associated with that.. So, what we instead did is, we tried to see whether what we're hearing from our professors and from the investors, is that really there? So we cold called a bunch of different cities, a bunch of different emergency

officials, and we asked them that, hey you know, we're three graduate students here, we have this algorithm, we really don't know whether or not it will be helpful or not.. Can we spend a few hours with you to just understand, is this really a problem, and we do do some impact here? And we were surprised that instead of them spending a few hours, they ended up spending several days with us..

The hope and the excitement we saw in these city officials, I think that was the final push to make us say that we have to do this.. It sort of came to light that it is a responsibility, and if we don't do it, will anybody else think about this problem, although this problem keep repeating itself? So then all the three of us, the three co-founders, we had a really hard conversation.. At least, actually several hard conversations about what we would have to give up in terms of our previous ideas and what does it mean to commit to a mission? And what does it mean to commit to a company? Now, while I talked a little bit about my and Ahmad as immigrants, our problems, Tim himself was raising a family.. So what would that mean in terms of his responsibilities? But at the end of those conversations, we said we're all in, we have to do this.. And once we figured out that this is the problem we want to solve, we then started thinking about the next step.. The next step is parallelly continuing our conversations on what the product would look like with the cities, but also figuring out that we cannot build a very complex machine learning pipeline for disasters with just the three of us, so building a team, building something actually feasible.. So that mean trying to figure out do we actually do this on our own, to raise money ourselves, or start looking at investors? It was hard for us to pitch in money ourselves, being immigrants and all, and so that meant that we did have to go through the investor route.. Now, that was a little surprising as well, 'cause when we went to investors we thought, obviously these cities are so excited, we heard about product/market fit, our customers really liked it, so investors should definitely jump on this idea and help us through.. But that wasn't what we saw.. For around nine months we mostly heard rejections..

And it's very hard to hear that, because along with the risk you're taking, you hear somebody really experienced, with a lot of expertise in building a business coming to you and saying, you have a noble idea, but it's just an idea, and you need to give it up.. I have an anecdote of a particular investor which we were really, we really respected, and that was one of the meetings which I still remember.. We went into the meeting, we gave our pitch deck, and the investor said, you know, if an earthquake happens, I'm just gonna walk out and go to my neighbor's house, this is such a silly idea.. You should start thinking about something else completely, and you've wasted so much time.. So nine months of just hearing rejections, nine months of not knowing, basically collecting debt, and then nine months of real, big fear from your VISA process, you know, what's gonna happen, can I still stay here? Do I have to go back to India? It was pretty scary for us.. But instead of having that bring us down, what we did was we took a step back, we said, you know, what are we not doing right? We didn't blame the investors or the feedback.. We realized there's something missing in what we are doing, which is why we couldn't portray our story to the investors talking to us.. And so we later realized that the problem was two-fold.. One problem was we weren't talking to the right set of investors.. There are different investors with different investment theses, so there are a few, in the seed stage, who definitely want to look at evidence in the market, you know, put a strong ratio or vig on that as part of investment in your company..

And given that there was no earthquake, gov tech product out there, just really high risk.. Whereas there were other investors who put a lot of faith on the team, is there a need, and that the team's gonna figure it out.. They really large focused there.. So we realized that we need to start looking at these investors.. The second thing we realized was what was missing in our pitch was we always talked about the vision, but very little about the feasibility of the business.. And knowing that we didn't know that too much, we took whatever help we could get.. We went to Stanford Venture Studio, talking to all the Stanford graduate students there, pitching several hundreds of times, and just brainstorming about what could be wrong.. We talked to investors for advice, even the people who rejected us, and telling them, what could we have done better, what is actually the problem? And we amalgamated all that information in, and ergo, eventually finding the right investor, and helping them understand exactly the perspective of why this idea should be present was what founded One Concern.. So fast forward today, we grew from the team of three to a team of 80, and our mission is for a world of resilience, where we see resilience in the three pillars of safety, equity, and sustainability.. And they obviously expanded from seismic to flood and fires..

And to talk about what the issue in seismic is, when an earthquake happens right now, what is in the hands of emergency responders? There's two things you might get.. One is a map, where entire neighborhoods or cities are colored a single color, you know red, yellow, green, telling them that that is the impact for a city.. The second thing is, you've probably seen it on Google, it's a shake map, you see really large, red concentric circles on the map, and that's sort of what a responder is supposed to take in, and do those lifesaving decisions.. So when you think about why the chaos follows after, it's obvious.. Just looking at a blurry map, how can a first responder know what to do when several thousands of people need help? So we moved from that idea into the idea on the left, really focusing on going really granular, on a block-by-block level, and even building-level, helping people understand which buildings are in what sort of collapse minutes after the earthquake happens.. And we don't just do building-level information, we understood that the people component is very important.. So, who resides in those buildings? Are they low-income, are they senior population, are they children? Because, the resources you send during a disaster are very different based on the vulnerable population who are affected.. Hurricane Katrina is an example wherein there were a lot of senior citizens who were abandoned, and they needed an influx of blankets, 'cause they were shivering during the hurricane.. But no one knew exactly what was the ratio of people who were affected.. So that's the second component we focus on in our product..

And finally, the third component is, we don't want to just predict which buildings are down.. All we want to help cities understand is what is the state of the city? So that implies not just looking at direct causes of impact, but also looking at secondary and tertiary causes of impact.. So, is your power sector down? Is your healthcare down? Is your water system down? And how does that ultimately go and affect citizens? To give you an example, you might have the strongest hospital in the world, which might be up during the big one, during a big earthquake.. But if the Hetch Hetchy system is down, or if the power system is down, and there's no sort of back-up plan, it still means that your healthcare is affected, it still means that citizens aren't getting that rescue.. So how do you portray a cascading effect of dependencies along with the impact map to your first responders? Flood we just released last November.. And we chose floods specifically because it has a larger impact, and it is definitely the impetus of one concern, the Kashmir flood.. It's more or less similar to what we do in seismic, the only difference is that you could actually forecast five days into the future.. Now, when Hurricane Harvey happened, or any hurricane happens, what data these cities understand is, a storm is coming, it's gonna come in three days, we're gonna get five inches of rainfall.. But how does that help you know who to evacuate? And how does it help you know who's going to end up drowning in that particular incident? So it's a plot providing that really granular impact, and updating your accuracy as and when you get real-time input from on the ground.. We are really transparent about how accurate or inaccurate our models are..

In fact, that's what cities love.. They want to know how can they help us make our models even more accurate.. We want them to be able to make those decisions after understanding where our models wouldn't work and where our models will work.. And the final, third component, which is still in development, is fires.. Fires are very close to California, the costliest disaster of last year was the wildfire in California.. Now the issue of impact knowledge, and situational awareness is even, it's probably larger or equal to that of floods and earthquakes.. You have, a fire's moving at 80 miles per hour, literally engulfing football fields in seconds.. And meanwhile the only data which is coming in is 9-1-1 calls, or reconnaissance, where you're driving around the neighborhood.. How does that help you really understand what the state of impact is? And how does that help our first responders or fire fighters really evacuate ahead of time? And so, that's sort of our different offerings.. And we moved to not just doing response, we understood that it's not just about, during the response, helping save a few lives, it's definitely about how do you prevent the loss in the first place? We work with cities like San Francisco, Los Angeles, and we are also in the midst of deployment internationally, wherein what we do is help them do more efficient planning..

How do you prevent this loss in the first place? One is just through looking at multiple different scenarios, seeing is your emergency response system actually capable of responding to it? Do I need to increase my budgets? Do I need to add more resources? Do I need to communicate better? So that's what we call our scenario planning.. But the second thing is about reducing the loss in the first place.. So that's through better city planning, that's through better infrastructure adjustments, or even addition of that Hetch Hetchy water pipe, which would have caused a lot of chaos to the healthcare in California.. So how do you really prioritize among all those decisions? And we're doing this not just for governments.. We are expanding and helping people work together in a resilience ecosystem, wherein we get in different commercial sectors and governments, talking the exact same picture.. During a large event, most of the small, medium businesses will absolutely go bankrupt.. So how do you have people understand that this is the state of what our disaster risk is, and how do I prepare for it ahead of time? So what we do here is, we call this benevolent intelligence, wherein we really want to use artificial intelligence for social good.. And we really think that we can enable a disaster-free future, and what do I mean by disaster-free? I mean that hazards will keep happening, you'll have seismic events, you'll have floods, you'll have fires, but cities and citizens will be able to immediately bounce back.. And that bouncing back would happen because of immediate response during a disaster, through better planning before a disaster, and even through better infrastructure updates.. And it wasn't, so that's one concern, and we've come here, like I said, we've grown pretty large, but it wasn't very easy coming to where we are..

There've definitely a lot of challenges we've had to face.. And so the two different challenges I'd like to focus on is, number one is surround yourself with the right people.. It's always gonna be about the people.. You have the right people, I think 75% is already half done.. And what do I mean by people? I mean by obviously the people you hire.. We've been lucky, we've hired not just diverse thought processes, like diverse in terms of age, gender, race, et cetera, but also in terms of thought process.. We have fire fighters, we have emergency managers, we have mayors, we have data scientists, we have a collection of a lot of different thought processes which enable us to understand how can we fix this through policy and technology? And make sure, definitely, that the bar you keep for your mission alignment is as high, or maybe even higher, than the technical bar or the business bar you're looking for.. Don't compromise on that, we've learned that the hard way, that we should never do that.. I'll give you a quick anecdote of an interview we did in the early stages of One Concern.. We had this really, really smart engineer come to interview with us, we were really impressed by what he could do..

So I interviewed him, and one of my other engineers interviewed him, and he was very rude and condescending throughout the interview, didn't let me complete my sentences, and I was taken aback.. And after we did a debrief, the CEO came in, so Ahmad, and he was like no, that guy was wonderful, he was very nice with me, he was very respectful, so I don't know what was the difference.. After looking through our debrief notes, it was pretty obvious that the person who came in had a bias towards being respectful to men in particular.. And that was a complete, whether or not he was the most smartest engineer in the world, I couldn't have somebody come in and be disrespectful to my team.. And this was not just something I thought of, Ahmad, the entire team, agreed that this was something we would always stand by.. So culture shouldn't be something light.. You should be willing to not hire if somebody is not your culture, and really stand by it.. The second people component, especially for a mission-driven company, is definitely surrounding investors.. So during the seed down it was a

little bit hard, but ultimately we ended up, in series A we got a lot of interest from multiple different investors.. Now, say we got somebody on the board who told us that this is a way you could get more dollars, but you'd have to give up your mission of saving lives in any sense..

Now that's a complete no go for us, as well.. And so we wanted to make sure that there is complete mission alignment with our investors.. And we took a lot of time with the potential investors, asking them, where do you see One Concern in five years? What would you do if you're not seeing dollar traction in these particular markets? Really just understanding how they would react to this, and are they really aligned to our larger mission of saving lives? And so we were pretty lucky getting the right board members on board, and I do think that is something you should always insist on, getting to know your board members and understanding that we are all in sync on what our mission is.. The third one, which is obvious, is your founders, the co-founders you work with.. So I was lucky, I was friends with my previous co-founders, we synced on our values, but you need to be, I've been so vulnerable with my co-founders several times, I've broken down completely, I've told them all the different flaws I've had, and they've done the exact same thing for me.. When things were rough, I could call either Ahmad or Tim at 12 o'clock in the night, and freak out, and let them know this is the problem.. And they would not take, hold it against me.. They would let me take a step back, and they would give me their perspective of what I could do better.. And I would always do the same for them.. Which comes to my second challenge, the emotional burden of running a company..

Being a founder is gong to be very lonely.. It's going to be very hard because you always want to be the pillar of strength for your employees, for your founders, for your clients, for everybody.. You know, you always want to be the pillar of strength who people go to.. And there's going to be a lot of ups and downs, many downs more than ups, generally in the start.. And if you're not careful it can take a really large toll on you.. You need to be able to take a step back and do what I did similarly in the rejection piece, which was don't take these rejections too hard critically on yourself, take these as opportunities to really learn from it.. How can you take that negativity and convert it into something you can learn from? And it's very important to find the right support system as well.. I have a very, my family's completely bought in, initially they weren't, and then my friends are completely bought in, and they know that I might not be able to spend six months with them, because I'm working so hard on One Concern.. But they all support me through and through.. So it's very important to find the right support system, otherwise it will be very, very hard on you..

And despite, I guess, one last component I want to talk about is don't look too much into the details.. When we started our company, the technology was very, very scrappy.. We just built a bare-bones web application, actually our machine learning algorithms were on a MATLAB server, and we didn't really care about let's find the most in this technology, and let's make it the coolest app ever.. What we instead focused on was let's work with the cities and really figure out what exactly should this be.. And now, obviously, that's not the case.. We have a very secure, lot of microservices, and we did invest in technology.. But don't overthink that, focus on what really matters, which is, is the problem even something you want to work on? And despite all the different challenges I talked about, I would always do this again.. The excitement I see with the team I'm surrounded with, the opportunity I have to just work with phenomenal people to make a difference, always makes it worthwhile.. And if I didn't do this, I don't even know, would this problem still be solved? Would anybody think about it? I'm hopeful that at some point, five years from now, we're able to create at least a single metric on our wall in the company, which talks about the number of lives we affected in a positive manner.. And that would be completely worth it..

And so, if there is a particular idea you have, and you really believe that it has to exist, you should go for it.. Do some research, obviously, the research we did with the different cities, but take that step and don't, and as long as you're completely committed and you have the right team with you, it should solve itself out.. So, I think that's pretty much it (laughs).. (Audience applauds) Okay, thank you.. Sure.. - [Audience Member] What have been your biggest challenges in fundraising and capitalizing the company? My guess is probably you'll say the jillions of people ready to write you checks, so what was that experience like and how did you get from where you guys are today? - So, this is probably going a little bit deeper into, is it the seed state or the series A state? You're just asking about how I brought the idea.. - [Audience Member] Start at how you've been able to progress to get where you are, raising capital for an early stage company is always very challenging, and you guys have obviously done a really great job.. And wondering what you learned through that, and what were the keys to success? - So, just to repeat the question, how did we manage to get investors on board our idea, and what were the large keys to success? I think it was first, we did a lot of research ourselves, it wasn't just trying to build something wherein we don't really understand whether the market wants.. We worked very closely with our cities.. And that, coupled with Ahmad's experience in the floods, we understood that there is a big problem here..

We knew that market research was probably not our expertise then, so we actually worked with different Stanford grads to help us understand what does a DAM or a SAM mean? How would we quantify this? How do you look into the dollars invested in disasters? How do we speak the language of an investor? And so honestly, if I had to shorten it, it's mostly about perspective.. I think we were missing the perspective of how we would, the perspective we had with the cities was pretty clear, they got us, they understood why it had to happen.. But we were missing that connection with investors, which was exactly how could you convert this idea into a feasible solution? So the nine months we took actually was just trying to keep iterating on the product, keep iterating on what the packaging would look like, how would this be a business? And I would say at the end of the nine months, it did work out, so yeah.. Yes, sorry.. - [Audience Member] I just have a question about sales strategy.. So I imagine that if you're a city or a state government, or something like this, there's an obvious benefit to disaster preparedness, but you don't know when the next disaster's going to be, and thus you don't know when you receive that

benefit.. So with that in mind, and with the fact that, like, cities' budgets are always constrained, how do you go into a pitch meeting with potential clients to just sort of make the investment work? - Good question, so cities' budgets are limited, but how do we, sort of, how does a sales strategy still work despite that? So what I would talk about is, now one of the people component I didn't talk about was actually the customers you choose, especially for a mission-driven company, you want to find the right partners who are also aligned to your mission.. Because we can very quickly decide to choose a small city who really doesn't care about this, who's just testing this out, and who's not completely committed to making this happen.. So what we did was really find cities like San Francisco and L.A., who not just would be big use cases, wherein we could go to other cities and let them know that this is why you should focus on it.. But because it had a large population, and a large risk, they were very, very incentivized on how we could make this happen..

Now city budgets are definitely still going to be difficult to maneuver, and so what we're trying to do right now, from a resilience ecosystem perspective, is help cities understand that disasters don't just happen to governments.. How can commercial sector come and pitch in to help governments move forward? So if I actually go ahead and repair that one pipe which affects my industry, why shouldn't I put in at least one third of that money and help the city out? And many people went through it.. It's a complex series of making sure different sectors have different value props.. So that's what we're doing now.. - [Audience Member] Yeah, thank you for the talk, I think it's inspiring what One Concern is doing.. I was wondering how many cities or regions you're currently actively working? - Yes, so how many cities are we currently working with? We have around eight cities we're working with.. These are all pretty large cities, and some of them we've talked about publicly, state of Arizona, Seattle, Los Angeles, San Francisco, and so, and some international cities as well, so yeah.. Go ahead.. - [Audience Member] - So you mentioned that your software, your clock, will provide several real-time analysis of data, so fresh, city.. So what kind of data do you track, where do you get that kind of data? Does it tap into like server privacy at all? - Yeah, so what data do we track, and is there privacy law which we are, which is present through it? So all of the data we look at is, there's a complex series of data we look at, we look at both man-made information and natural environment information, I'm sorry I forgot to talk about that..

So every information regarding a building, what's the age, what's the material, what's the square footage? We look at lots, collected soil samples, elevation, and then we also look at the third component, which is live data, sensors, and satellites.. So we look at river gauges, seismographs, weather data, et cetera, so it's actually a very fairly comprehensive amount of information we have.. And we're very up front with our cities that we don't want any PII information, all we want to do is ensure that we are helping rescue.. So we notice on the platform, we could technically do building-level predictions, but we obscure it through a census block-level prediction instead, unless the building itself is owned by the person, and then we provide a more granular prediction.. - [Audience Member] How do you handle any end concerns that come with, any industries paying for this service and then they might get preference in a disaster that responders go to them first? - Yeah, so the question is, what if an industry pays more dollars, and then they get a priority in response, how do you deal with it? I think the best way is to make sure that the risk itself is transparent.. You know, as long as all the different players understand that this exactly is what's going on, and the city is always where we talk to first.. It's always going to be about how can we make the city better.. So as long as we're making sure that that's the first lens we prioritize on, other things sort itself out.. All right, go ahead.. - [Audience Member] How do you verify the accuracy of your models? And how are you going to help developing countries, where maybe those data sets don't even exist? Thank you..

- Validation of accuracy, this is very, very hard questions.. But validation of accuracy and how do we create data in developing countries where data doesn't exist? So our validation process is fairly complex.. So technically, the fire model was completed last year.. But we haven't deployed yet, because we are going through a very, very rigorous series of validation, going across all the 500 fires in California and seeing how exactly it performed.. Standard validation, standard cross whole validation, we also do event-based validation, when we completely take out an event information, and see whether or not we're all fitting to a particular event.. We put a lot of effort in collecting damage whenever an event happens.. So we were there when the Indonesia earthquake happened, we were there when the Mexico earthquake happened, we were there when the Alaska earthquake happened.. We collected around 40,000 buildings of damage information in Indonesia, not just to figure out okay, is our model right, is our model not right, but also to understand the localized information surrounding that.. The second one was how would we create data in a place which doesn't have information.. So we're actually deploying in an international developing city, which doesn't have a ton of data..

And what we do is, so how do we get this information? Some is public, some is private, and some is from the clients themselves.. But a big component of the data is, we generate ourselves.. Now features which we statistically infer in the middle, there's a lot of gaps, for some buildings we might have the cost of the home, for some buildings we might have the height of the home, it's not necessarily that all of them are filled.. So there's actually many models and statistical inferences to even help fill those gaps.. That's one way we could do it, just looking at correlating information.. But the second way is we create the data ourselves.. So to put it in short, it's sort of like a Google street view, but for buildings and people.. So I don't wanna talk too much about it, but that's how we are doing the developed cities.. Yeah, go ahead.. - [Audience Member] As a fellow immigrant who would like to form a company, What challenges did you face, and how did you overcome them? - Yeah, so as a fellow immigrant, what were your major challenges and how did I overcome them? So, I was a little lucky, unlike Ahmad..

My family was more or less on board, and they were like, you do what you have to do.. I don't know if you have the similar

issue wherein you have to convince your family about the risk you're gonna take, but that's gonna be a exciting challenge.. The other challenges are just, like I talked about, it's, number one is also whether, would people want to invest in a company which looks the way we do? And we are selling to government, you know, CEOs, you know, how is that gonna work out? So the perception was something which hurt us a little bit, I would say, but we got through it by just making the right relationships, actually making cities happy.. And then after that, it just becomes a blur, nobody actually looks at it anymore.. And then, obviously, the VISA issues, the debt you would probably have to think about, because you already come here, but all of that will sort itself out if you do have an idea which you really believe in.. You.. - [Audience Member] As three technical co-founders, how did you think about splitting roles and developing specialties within the company, and external facing? - So three technical co-founders, how did we split up the roles? I was the computer science background, so naturally the thing I naturally gravitated to was helping in the technology side, and being the chief technology officer.. Ahmad was the one who was super passionate, who really connected with people, who really had the vision through, and it was natural that he would be the CEO, we were completely on board.. And our third co-founder came, he actually told us about the cities, he told us, since he's from the Air Force, he talked about how there were emergency operation centers in the airports, and there might be something similar in cities, and states, et cetera.. So he sort of helped create the product, I would say, at the beginning..

It wasn't too hard, we just chose what we liked and we went through it.. There wasn't, I don't think there was too much of a ego issue, because just the mission came first.. And we were just sure that, well, this is what we do well, so let's just do this, so yeah.. Go ahead.. - [Audience Member] You have mentioned that government and investor are different, so how can we reach these investors who was taking care of preparement issues and consequence? - So how do I reach out to, how did we reach out to investors who think about this problem, is that correct? I think it was more word of mouth, as well as talking to the different people we knew.. Like which investors would gravitate towards this particular idea? Just looking through investment theses as well, that's how we did it, and we just really used a lot of different connections we made internally.. We hustled a lot, we talked to whoever would be willing to give us a connection, we co-linked in several people as well, and I think that's how we mainly networked, honestly.. Go ahead.. - [Audience Member] Do you find yourself wanting more basic science data, like kind of realistic virtual Earth geology, realistic virtual Earth hydrology, realistic virtual Earth atmosphere? And how would that improve your predictions and allow you to connect the cities more richly? - Good question, so should there be more investment in the natural sciences part, and how would that help cities? So, we are working on something called a resilience alliance, wherein we actually work very closely with universities.. We understand that all of the science behind it, we can't do it ourselves, so we're working with University of Michigan, we actually are also working with the Stanford Urban Resilience initiative, multiple different folks wherein we would talk about a particular focus, and really invest on the natural science component together..

So that's how we do it, it's very important, because it can't just be us building all of it, the accuracy may not go as high as you would want to then.. Go ahead.. - [Audience Member] Can you tell us a little bit on how you see the company scaling over the next couple of years, next year or two even? You know, is it more cities, is it greater penetration within the eight cities that you already have? That would be my first question.. And then the second question, which is along the same lines, what's the long term goal? I mean, you have investors, they are gonna exit at some point, do you hope to have a strategic buyer, or how do you envision it near-term, and then kinda five years out? I know that's a big question.. - So let me take the second, uh, can you repeat the first question a bit, I just want to make sure? Okay, so for this particular year we decided we don't want to do anymore cities, we want to go very deep down into the city space, getting all the different commercial sectors and governments on board, to talk the same language.. So make sure that resilience and safety becomes a top priority, and people are talking about it in that language.. That's what we're working on, I don't, from the what is the exit strategy, a lot of rally large companies are doing really phenomenal work in terms of the convenience space.. So now everything is super convenient, we can get food conveniently, we can drive to work conveniently, but the safety space, which is actually probably higher on the Maslow's triangle, is not, there's very few companies thinking about it.. You know, healthcare is an example.. We really believe we have an opportunity to actually be a large business..

We're not thinking about exit right now in any sense.. We're definitely thinking about how do we make this problem actually be solved, that's along the the way.. There.. - [Audience Member] Was there any consideration at the very beginning of a structure as a nonprofit versus for-profit? - Yeah, so did you think about structuring this as a nonprofit versus for-profit? We actually thought about that, and we had a few, and I would say that actually the cities gave us advice, so the cities actually helped us a lot, they helped us not just in creating the product, they even helped us figure out what the pricing was.. You know, we went to them and said we would only charge this, and they were like, that's too low, no one's gonna take you seriously, and you need to bid something here which we can go back to.. And the third thing they actually helped us out was, nonprofit versus for-profit.. So we considered that, they were like, if you do a nonprofit, unfortunately you won't get the velocity which you'd want, and we want to be able to create a impactful company and solve this problem in our lifetimes.. We don't want to keep hearing the issues of climate change and disasters several decades later.. So that's why we chose for a for-profit route.. - [Audience Member] What's the name of your monetization strategy and what's the ROI for the government? - So monetization strategy, ROI for the government..

The ROI for the government is twofold.. Number one is, obviously, in the lives which could get saved and the livelihoods which are impacted.. But number two is really understanding what exact dollars do you need to invest in terms of infrastructure, which equally benefits everybody? You can't keep having hurricanes like Harvey, which keep having the federal government pour dollars over, and over again.. It's a cyclic issue, and there's no way of coming back out of it.. So

there is a conversation of both the dollars saved and the lives lost, that's sort of how the government scheme works out.. Our monetization strategy, I should talk to you in private, but there's a lot of different angles on how would commercial sector and gov tech work together? Cool.. Yeah, sure.. - [Audience Member] Have you thought about doing a national version, instead of just like a city by city? - A global version, a global model, that's what you're talking about? - [Audience Member] Well a national, like one step up, like what the U.S.. government might see is the best? - Oh, working with FEMA, for example.. - Yeah..

- We did think about it, actually we had several advanced conversations with FEMA, and they're pretty interested, but disasters generally happen to cities and less to FEMA.. I think FEMA comes in when it becomes really large, and tries to, and provides dollars to help the cities recover.. The whole process of recovery itself, you know, what resources do you need, how do your first responders work with, it is very, very state and city-driven.. So that's why we decided to go that way, to understand what we could do there.. - One more question.. - Yes.. - All right, yeah.. - Time for one more.. - Go ahead.. - [Audience Member] Just out of college I see..

I was at a talk a few weeks ago, there was an engineer politician from Taiwan, they spent eight billion dollars on an information system for flood prediction and landslide analysis around 7,000 villages, eight billion.. - Eight billion, okay, that's news.. - [Audience Member] I have his contact, but I mean, tremendous opportunity outside.. - So we should look into that then, probably.. Well thank you for letting me know, yes.. (audience applauds) (techno music)..