

Case B

Participant: Designer 3 (P)

Facilitator: Xiao Zhang (R)

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R: #00:00:55-6# Can we start?

P: #00:00:58-4# Yes.

R: #00:01:02-1# In our first interview, you talked about your experience of the Mother Nature in the malaria season in the villages of India. And I also saw the images you shared with me. I think you have talked about two main points in terms of this experience. First is leaning to give up, and the other one is fighting for control. So first question is what do you mean by "learning to give up" and how you connect these points with your system?

P: #00:01:57-8# Sure. So I would say as designers, when we go to the fields, we are sort of exposed to the various factors that are beyond our control and we are sort of one level to be spectators, so there could be two possible ways of you know carrying out research. one is you know trying to make things the way we want or other ways to accept the things as they come because we are dealing with people and also they are all in one environment. so it is quite obvious that we don't have control of many factors, and as designers, you must be open minded enough to accommodate any kind of you know exposure, or any kind of circumstances that we might sort of reach or might be sort of brought into during the course of the study. so if you talk about my system, there are so many environmental factors for example when we carried out this research was raining and sometimes we have to wait for the doctors they weren't available, you know, sometimes there is no electricity and we wanted to use you know the computer for example to document something, but there was no electricity and in one center which was part of our research project, there were no mobile signals, so the health worker had to actually work a few hundred meters to you know, get this signal, then report the number of cases, so things like that, these are very unexpected things and you know, we must learn to sort of re-accommodate of such circumstances.

R: #00:04:16-6# The other point is "fighting for control", what do you mean by this point?

P: #00:04:37-6# So if you look at these, both are very closely related, in a way they are two sides of the same coin. I would say, so one is at one instance you want to "give up", or "give up" not in terms of losing hope, but "give up" in terms of going to the flow and letting you know in accepting things. On the other hand, the other part of, you know, a designer is not to, you know, just "give up" in terms of at the effort, so there is always this you know "fight for control" in a sense that ok, how can I influence, how can I make the most sort of the situation. So it's not really trying to change the circumstances but rather trying to, it's rather a hopeful approach where is trying to make the most sort of the situation. So for example, you know, simple things like when we went out to meet these health centers in the villages, there was no food available, because in the villages there are no restaurants, so we would simply you know stop by whatever we found, a very small places where we can eat food, so there is nothing that can be done, we cannot carry pack food everyday, it's extremely impractical, so you know you must be accommodative, but then when we go there, we try to make the most sort of the situation by you know making sure that the food is at least warm, because we had the whole medical team with us, so two doctors, many times there were three doctors and because of them, I had this sort of

privilege of being advice nicely in a sense that they would say that either eat spicy food or hot food, eating them are safer than eating you know any kind of foods or any kind of uncooked food, because usually in that season it's very important that we must have cooked food, otherwise it could be really dangerous for our stomachs.

R: #00:06:55-4# Ok. Did this experience and what you learnt from this experience directly influence the design of the system or your work style or process?

P: #00:07:41-6# Ok, so I wouldn't say that was like a drastic impact because when we were doing the user study, you know, we understood the environment. So when we did this system and we were evaluating that there wasn't like drastic change in the system, because the environment was so different than what we taught, we did our own work well in terms of, you know, trying to find out what kind of contexts we are entering in, so there were no deep surprises, but let's say simple things, practical things like sud system. So malaria happens usually after the raining season, so what happens is the rain sort of you know give so much of water on the ground, and this water becomes stagnant in a period of time, and when, typically the Malaria or rather the mosquito larvae will form or will flourish when there is a break between 2 raining sort of periods. So if it rains everyday, it's not a big problem. you know, malaria wouldn't be a problem, because the water is not stagnant, but if it rains between with a gap of let's say two or three days, so that's a very good raining season and breeding time for the larvae, and things like that. So what we sort of, it intactly influenced our system in the sense of how the reporting happened, so, and also we must understand the system was used by humans, that is you know by the health workers, so whenever there was let's say a breaking rain, there was already an exemption that the number of malaria cases would be high or possibly it would be high, not directly the number of cases, but it's possibly it's such cases. So that means the doctors would expect more number of patients and hence they would be ready to you know, look at our data more frequently, compare to for those raining everyday for let's say one week, then they would already know and in their own minds of that experience, that you know, we can look at the system, but they are sure that there won't be so many cases of malaria, because you know, the mosquito breeding hasn't started yet, so things like that, so the use of the system was influenced by environmental factors, not really the design of the system, the basic requirements of the system in terms of you know why is it in such a harsh moment we are taking care of, so our, the devices that we use in the project where quite sturdy and they are ready to work without for example, recharging for a longer period of time, because electricity is a big problem in such areas, especially long zoom season, the electricity would be maybe available for like you know 4 hours or 6 hours in a whole day because there is a big risk of you know electrocution or shock because it is raining, and in India, in the villages, all the electricity wires are exposed to the environment. So the government or the local electricity office will switch off the power when it is raining. And in the raining season, it is raining all the time, so the power would only be available couple of hours in the whole you know day, so how do you recharge your mobile phones, if you don't recharge your mobile phones, you can not really you know send the Malaria data. So we knew such kind of situation exist, and that's why we make sure that our phones had a longer battery life and they can survive you know, couple of days without recharging. So we could also see some kind of improvisation happening. So some health workers switch on the mobile phone in the evening, and then they will report the Malaria cases, and then switch it off again just to save power because they know that there won't be electricity for the whole day. So this is how to improvise based on the environmental factors.

R: #00:12:10-5# so that means when you were in the field, you learned more about some new situations you never thought about. And is there other people in your team who went with you to the village?

P: #00:12:44-4# no, no, so it is usually me as a designer, one person named Depok, so I will on the site note, I have contact that person, and he might be willing to help you in terms of talking to you. He is a technical person, but he has been very interested in you know, using technology for the sort of more human way. So he is interested in both, he is not a designer, but so this guy was with me all the time, because fortunately he was from the same area, not from the village but he knew the local language. So from the nearby town, and he was at that time, recently graduated from his masters in technology, so we had hired him you know to assist us on the field and also on the technology part. So me, Depok, and one more person from the medical college, or the medical university was always with us. So we were usually group of three, and it was me and Depok, so 2 of us, I was never alone because one of the challenge in India is, India has 22 official languages, and more than couple of thousands different dialects. So I am an illiterate in the area I went, I am a foreign and I can't speak local language of that area, so I needed this person, Depok, who was from the local area, and he knew the language. So I would talk in English with him and he would translate it into local language.

R: #00:14:22-7# Because this is a large project, so I am wondering did you communicate what you experienced in the village with other team members?

P: #00:14:57-3# yes, yes of course, but I would say I can only describe and share, but experiencing it first hand, it's a very different thing. So some of the major problems or challenges you know, such sort of conditions, are having to test our system in such conditions, and communicate it, and the team understood that very well that you know, we must ensure that our system would work in let's say multiple ways of sending data, for if mobile network is not really available all the time, maybe you know, as same as kind of thing could work, so then whenever the network is available, it will just send them as soon as easily, you don't need to really you know, keep calling a number and things like that. So we sort of make sure that we have multiple ways of inputting data, but I would say there was so many other things which I, they are interesting to share, but they might be irrelevant to a lot of people. And especially sort of from, because when you are on the field, you are sort of mobalic with so many things, and it's one area of person experience you know that you sort of, you know when you grew in that system, you grew in that context, what I meant to say is, you absorb these things and it sort of helps you understand or be more matured, and it's different aspect of life, you know, sometimes, it's like you are in a movie, you know, you are influenced by some many other things, and which our colleges are of the same education background, they are sitting in the office, you know, couple of hundreds miles away, and they never get to experience this. So whenever I describe you know, it's more sort of taken from amusement and sort of you know like raw point of view rather than actually learning or understanding from them. So it's more of information, not really knowledge you know, for them.

R: #00:17:23-3# ok, that means you just describe what you have seen, but you never told them your understanding or interpretation about what you have seen?

P: #00:17:44-3# nah, its' not really like that, I would sometimes also describe my understanding, but one, so I was on the field most of the times, so my only communication with my team back home was rather you know brief, so every now and then we would contact if there was a problem or if there was something to be change or things like that, and then the team would visit maybe once in a month or something like that to the field, to you know understanding what is going on. So I had I would say 3 months of exposure and I cannot obviously share so much of you know knowledge or information with them, so I would only share things which are relevant, which are interesting to them, which are relevant to the system, but there is a lot more other

things going on which I personally think it's lot of value.

R: #00:18:43-4# ok. So when you were in the field and thought some changes should be made on the system, how did you do that? Did you have the power to make the design decision or you need to talk with other team members to make a decision?

P: #00:19:46-3# right, so the sort of initial concept was thought about after a lot of discussion and it was like a well debated sort of system, so we knew the formation is very strong. And the changes that were related were always based on the feedback from the medical staff. I ensure that I never mere any design decision which on my own, so I would not concern my fellow design, but I would concern the doctors from the medical university because they are the subject matter experts. So if they like something and they understand something, for example, you know, I created this visualization of the meter, the outbreak meter where they could compare the Malaria cases from previous year and the current year, it will tell them whether they are near the outbreak or very far from the outbreak. So things like that were all my local decisions, but they are never in isolation, they will test it or they will concern it very well with the medical professionals. And my manager was very supportive during that period, and if, so he would also talk to you know, the doctors, and if the doctors said yes, this is what we want, then it's very clear that we don't you know, try to influence that decision, because automatically, the system was to be used by them. So I was responsible for the system, and I make sure that if the doctors were ok with the changes, you know we should go ahead with that.

R: #00:21:29-8# so when you saw there should be some changes in the system, how did you do that? directly change the system and then ask experts to test the new version?

P: #00:21:56-0# I wouldn't change the system. What I would do is create a very low fidelity prototype, for example, I use prototyping to like flashlight, so I can actually make a prototype on a mobile device and show it to them. And they will you know test the mockup prototype, and see if it serves their purpose. So if it does, then I would communicate that with the technical team because making a change on the system is a huge thing, you know, and once you make the change, if someone doesn't like, you undo it, it's not a very practical thing to do. So I use my design skills to you know create a prototype and basically test it with the experts before deciding to change.

R: #00:23:14-0# you have talked about your experience in childhood and your experience of mother nature, how did you add these experiences into design decision?

P: #00:24:37-5# right, so let me give you a small example. So our project had 22 health centers, you know by it, and all these health centers were located at very different distances from various state. So some health centers were really far, so really far in a sense that it would take about 1 and a half hours to reach there, not because it's straight through, but because it's hilly area. So you know it takes time driving slowly and reaching there, and they are really really far. And because of this, and it is, you must understand, this is like rural India, so the mobile connectivity is not very good. So health centers which are near to the town have good connectivity, but health centers which are very far from town do not have very good connectivity, so we would experience that sometimes, the mobile signals would be available and sometimes it won't. And for us, which our system was a mobile system anyways, so without connectivity we cannot really work in the sense our system wouldn't work. So we must ensure that you know there is ample connectivity, and that's where the whole situation of trying to get gaining control v.s. gaining up comes in. We cannot change the fact and the general course, we cannot like set up new tower, right? But what we can do is we can monitor the signals well and then you know

plan our future modifications of any decisions required. So what we did was, and we did this completely on the field. So when during the first few days, then we were traveling, they would look into a mobile phones from time to times, especially when we were traveling, and we would down in number of bars on the signal, I can do, you know, gain some knowledge on how many bars are we getting, so how powerful is the signal? right? So sometimes we get 1 bar, sometimes get 2 bars, so we know, ok, the signals trend is low, so we make a note of that. But it was a big problem because when we were traveling, you know the road is not very, I would say the rural roads are you know, full of buck holes, maybe some cases, there is no road, so if you are traveling, we cannot really look at the screen easily, you know, the hand is shaking, we are shaking, and we cannot really observe or try to monitor the signals trend. So what we did was, we created a very weak flashlight program to monitor the signals trend in real time, and we did this on the field, we didn't tell our developers, but I did it on the field one day. And the next day, I just took this out for testing whether it works or not, and it worked fine, and then we use this as a tool to monitor this signals trend you know wherever you are. So it's a big visualization of how much signal, how many signals trend is available. So it would tell a person that whether it's 100%, 90%, 80%, so it was very easy for us to you know use that information rather than counting that very tiny icon bars on the left hand side of the mobile phone. So this was one practical way of you know, using design skills of prototyping on the field so that we can solve a practical problem.

R: #00:28:27-8# The last question is how did translate your understanding of "trust" into other forms that developers were interested in? can you give some examples?

P: #00:29:23-9# well, so, I am not sure if I understood your question, but let me answer it anyways. So for example, the feedback mechanism, so what was happening is, when the health worker would. So let me give you 2 examples, first is the feedback example where initially, we were thinking of a system where the health worker can send let's say the number of Malaria cases everyday, and that would be stored in the system, and then in sometime, it would be processed and then it would be available to the doctors, right? But then we understood that this is like a very, what we can say, it's a very, it's not as static as I work, but it's a very form based mechanism, which means there is no instant feedback, and how can people trust whether you know whatever gets sending is ok or not? For example, let's say if I am a health worker, and if for whatever reason, by mistake or by error, if I send wrong number of Malaria cases, let's say 20 Malaria cases. 20 is a huge number for one day, it cannot be 20, right? But if I do send that, and then how do I know whether you know, what I sent has reach the system or did I make a mistake? There is no record of it because it's a you know, online system. So my exposure is only to the input not the output, so you know how can I trust the system? or how can I trust myself for my own decisions in that sense? So then we created a feedback mechanism which means when you send the number of Malaria cases, it would, the system would automatically send you sms back, saying you reported so and so. So it's received from the system, so I look at the receive and I say, and if I see, oh, 20 number of Malaria cases, then I realize instantly, this is a mistake, I must correct it. So I send another message, right? And where we, we sort of accommodated corrections, is a very non-traditional way. So traditional approach of collecting data would be someone reports let's say 20 Malaria cases, and then he realizes, oh, it's wrong number of cases, so let me go and edit the data. So that is a very traditional way of you know changing the data. But in our case, if include editing the data, it involved so much of complexity, which means the health worker has to see the record, look at the record, press the edit button and change the data. That's too complicated for the health worker. So what we did was, we used a very simple rule, if you send a message now, and you will get a confirmation back. If you think that data is wrong, you must, you have about 6 hours to correct that data by sending another message. So if you send any other message, any other report within 6 hours, your

latest report would be the right report. So if you send 20 cases Malaria, it's wrong, maybe in 2 hours you realize because you get a message. Then maybe after 2 hours, you send the correct number that is only 5 cases of Malaria, so that will overwrite the previous data, and you will get a confirmation. There is no editing of data, your latest data is the final data of that day. So it creates a sense of trust by giving the feedback. You know and instant feedback is very helpful in gaining confidence that yes, the system is recording our reports, and the system is responding. So it's like alive, you know, it's interactive, it's not a dump system where I keep reporting and nothing happens.

R: #00:33:35-4# ok, so from this example, trust in this project not just means trust between different people, but also between the system and user?

P: #00:34:56-7# yes, exactly, you got it right. So because I cannot emphasize on, well I can describe to them that it will help in you know, creating more trust, but maybe technologists are more interested in creating a better technically capable system. So I would translate that, ok, why don't we send out a receive through sms, so that they get a confirmation. And yeah, they like the idea and they go ahead and do it.

R: #00:35:23-2# so what is another example?

P: #00:35:27-8# So this is more like a very direct solution, but I would suggest. Another example is more subtle and indirect, right? So and this is totally unplanned, we never thought the system would be used in such a way. But I think I have said this earlier also. So people, the doctors were using the maps to sort of make sure that they don't want to be in the red zone, because being in the red zone, which is, so if you look at the monitor in system where there are so many visualizations. There is one visualization of a map where all the health centers have a geographical area assigning to them, and the color code of that geographical area would depend on how many cases of Malaria are reported from that particular area. And this map is seeing by all, so 22 doctors of health centers, 1 district Malaria officer, and 1 district health officer plus other the doctors from the university, so it's in a way where is not a public information. But it's available within one oral organization. So doctors became quite efficient in you know trying to maintain low number of Malaria cases and when they...So the trust between the system and the doctor, the relationship sort of increase throughout a period of time when they saw that their interventions directly translated into you know the color changes happening on the map. So you know if they are in yellow, if they do preventive measures like fumigation or awareness scan or things like that, it automatically reduces the number of Malaria cases and hence they will move away from yellow to sort of green zone, things like that. And also, it would also play a role in relationship between the district health officer and the health centers in such a way that, if a health center remains in yellow or green for a long period of time, that means you know, things are going ok, they are not worsening for example that things are not going really bad, you know the doctors are trying their best to actually maintain or rather control this spread of Malaria, because they are still in the green zone, they are still in the yellow zone. The only exception was that some areas for example were so highly vegetated during the raining season, that means there were so many trees and so many nature things like barns and you know streams that is impossible for the doctor to control. So you can rather like going a jungle and you know spread Malaria, let's Malaria clean medicine or something like that, you simply cannot, it's in moment. So in that cases, the number of Malaria cases would be higher anyways, but this is very well understood by the health officer, the district officer from their past experiences. So that was one of the exceptions of creating the trust. So although the visualization would show red, but it does not mean that the doctor is not doing his job. It means that maybe due to a moment of factors, doctor cannot go much in that kind of area, so I would say that is an indirect

sort of trust there as well because the system shows that there is a red zone, there is a problem, but there is an understanding also from the health officer that from the past experience, it has been already known that the cases would be high and doctor cannot do much.

R: #00:39:51-3# can you share some of the images of the interface or images of the fields?

P: #00:39:56-5# yes, I can do that. so is this for publishing or? how do you want to use this?

R: #00:40:19-1# I think the images will help me to understand the project. If you don't want me to include the images in the thesis, I will not do that. Anything you think it's not ok for a publish paper, please let me know.

P: #00:40:43-3# yes, sure, so I don't have any problem if you publish it, because it's already published work, but I will share you know more images which are not really published. But that's for your reference, I will tell you what are the published ones which you can publish.

R: #00:41:01-9# yeah, I think you can mark the ones that I can publish.

P: #00:41:08-9# yes, I can do that, so right now, let me send you a powerpoint. This is for your reference, when you want to publish, just let me know, and I will send you the publish.