



## INNOVATIONS FOR SUCCESSFUL SOCIETIES

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Interviewee: Nyimbi Odero

Interviewer: Gabe Kuris

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KURIS: I'm here with Nyimbi Odera. Can you tell me a little bit about your background and how you ended up here at INEC (Independent National Electoral Commission)?

ODERO: *It's been a long and varied career. I've done a whole bunch of things.*

KURIS: Okay.

ODERO: *I think most recently, I was head of Google, for English-speaking West Africa and my job was essentially to evangelize the Internet and to bring users online. So it really was a very interesting, technical, developmental, and entrepreneurial sort of role. When I was asked if I would help out with the technology at INEC, Google very graciously gave me leave to do so. So I did. That was September last year, so I've been here for one year.*

KURIS: How did they ask you? Do you know how they got your name?

ODERO: *I had walked into the commission to look for polling data and stumbled into a bunch of meetings. It occurred to me, by golly, this isn't how it is done. So by the usual network of friends and influences, eventually I got introduced, inducted and conscripted pretty much into the grand task of trying to assist in the running of Nigerian elections.*

KURIS: You came here as a consultant or—?

ODERO: *Since the commission didn't have the money to actually hire me, I pretty much came aboard as a volunteer. A little later on they managed to get a grant from some of the donors, to provide me an allowance. So I got accommodation and transport and a job to do.*

KURIS: Was this from the US/UK (United Kingdom) donor basket?

ODERO: *I think it was managed by UNDP (United Nations Development Program) and later on by the Ford Foundation to whom I shall remain eternally grateful. They did a particularly splendid job.*

KURIS: So you said you walked in and you said, "By golly, this is not how things should be done." What kinds of things were you talking about? What was going on?

ODERO: *The intent and the determination to succeed were there, but let me perhaps paint a picture for you. I joined on September 1<sup>st</sup>. At the time, elections were going to be held in January of 2011. That meant that we had September, October, November, December – four months to do everything required to actually put an election in place.*

*There had been a general consensus across the polity and across the nation that the old voters' register was unacceptable. It was patently and obviously unacceptable. We had thousands of people called Michael Jackson and a very large number called Nelson Mandela, which might make for a particularly well-meaning populace but it doesn't do very much for a voters' register.*

*As a consequence we pretty much needed to do the voters' register again. Now the law at the time stated that sixty days before an election, the commission shall provide a certified voters' register. What this meant was that if elections were going to be in January than we had December and November as certification*

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*months, so by the end of October we needed to have registered 70 or 80 million people.*

*We didn't have the equipment, we didn't have a plan and we didn't have the software. So we had to pretty much start from ground zero. All previous equipment that the commission had acquired was defunct, obsolete and totally unusable in the opinion of everybody who saw it, myself included. There was absolutely no way of reusing that equipment in order to achieve our objective.*

*There are a whole bunch of political, economic, technical and procedural challenges that emerge. Let me try and walk you through some of them.*

KURIS: Sure.

ODERO: *You've got two months in which to register 80 million people. The law is rigid about this. Fortunately for everybody concerned, everybody saw the impossibility of actually achieving that target. There was a little bit of flex in the law, so the legislature very generously and kindly but also very realistically and pragmatically reduced the period from 60 days to 30 days prior to an election when you must have a certified voters' register.*

*In any case it was determined that part of the reason for the corruption in the data in the register was that we've got polling units. A polling unit is where people go and vote. It is also where they are registered. It was determined that because we had used one device to capture people for multiple polling units, in many cases people would think they were in one polling unit but they were actually assigned to another.*

KURIS: Okay.

ODERO: *So people would now register at only the polling unit at which they were going to vote. So we now needed about 120,000 registration units in order to make this happen. Of the 120,000 we also determined that since there would be a whole bunch of equipment that would arrive in an unstable condition and break within the first week or so, we allowed a 10% margin for this, which thus required 132,000 units. Anyway, we now at least have this number, and we still have two months. It is an extremely trying period. Everybody is working hell for leather; it is a totally manic environment.*

*If you've got to deliver 132,000 units of anything in a really short time there are certain basic things you need to do. One, it cannot be proprietary. Two, it cannot be expensive. Three, it should, as much as possible, be a commodity off the shelf piece of equipment so you can find it. And four, it should require minimal training to operate because you don't have the time to actually train anybody to work anything complex.*

*In any event, the task then fell on the commission to assist with this. The question was where could we acquire 132,000 laptops, webcams, fingerprint scanners, printers, toner (for the printers), paper, backdrops, scissors and weatherproof cases in a 30-day period. We talked to all the large manufacturers. We spoke to IBM—they said, "You guys must be joking." We spoke to HP and they looked at us and said, "You're kidding, right?"*

*So we said, okay, if these guys think they can't do it, we're going to have to backtrack a little. So I went back, looked at the devices and went down to the component level and said "okay, where am I going to get 132,000 processors,*

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*RAM chips, motherboards, cases, all this sort of thing?" I had to design pretty much everything from the hardware through to finding the fingerprint scanner, and I had to work on the BIOS to make sure it would work with Linux. I had to work with the cameras to make sure that their performance was optimal. Then on top of that, you have the whole packing problem. How do you pack these things so they occupy the least amount of volume? Of course then there is the weight.*

*How are you going to power these things? You might have heard that we have some slight electrical power challenges in Nigeria. In any case what it means is that we have to provide independent autonomous power for each of these units and they must work for the whole day. Traditionally people have used car batteries and an inverter. We went a step further and redesigned the entire power system to use an extended lithium ferrous phosphate battery, which is extremely light. It comes in just under a kilo to bypass all the inversion and transformation issues in the power supply and go straight on to the motherboard so that there are no conversion losses. I hope I'm not being too technical.*

KURIS: No, this is good.

ODERO: *Anyway we eventually worked it out that one of our batteries, weighing in at just under a kilo, would provide between 12 and 14 hours of operation for a laptop and a printer, in bright sunlight and in ambient temperature of about 38 degrees centigrade.*

KURIS: Did you find this out by testing it or was it theoretical?

ODERO: *It was a lot of theoretical work and then you test it, because reality tends to not conform to theory all the time.*

*Anyway, so we now had to ship the stuff in. One of the key things about the Nigerian environment is that it was determined very early that we were going to be the good guys; we were going to remain absolutely transparent. Our bidding and procurement processes would be completely open and we were going to be completely fair. That is something I like. It is a wonderful game theoretic-scenario. Ask yourself how do I ensure fairness? How do I ensure nobody can pervert the system in order to get an unfair advantage? How do I ensure that the best people actually get this and how do we actually get the very best price?*

*If somebody charges us a dollar more for each unit than we ought to pay, that's \$132,000. If he charges us \$10 more, that's a million dollars. So down to every last cent, it counts. We set up a reverse Vickery auction as it is called. The general idea is that you gather all the bidders.*

KURIS: Local bidders or international?

ODERO: *Local and international. You put each of the bidders into a different room. Put a flag in front of them and give them a method of sending in their quote. So you press a button, they all send in their quotes, and you look at all the quotes and for the lowest quote you put a flag up so that they know that they're the lowest. Then you iterate this. You then give everybody else a chance to send in a second quote.*

KURIS: A second offer.

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- ODERO: *Yes, but they don't know what anybody else's is. Only if they are the lowest bidder does the flag go up. Then at the end of it all, you give the lowest bidder the price of the second lowest bid.*
- In any case we eventually set up scoring criteria, which we published well in advance. We set up a mathematical model for weighting different scoring criteria and published this as well so that people out there could understand what it is we were going to do. We then sent out the Request For Proposal to which everybody responded. The idea was to make it an almost mechanical process so that any impartial third party attempting to reproduce our activities would come up with exactly the same outcome. That would prevent any form of collusion with either vendors and people inside. You have to protect yourself from both the people on the outside and from the people on the inside, because we sought to absolutely transform the entire environment.*
- KURIS: Is there any established industry? Are they used to certain procedures?
- ODERO: *You see there is an unfortunate side effect of corruption. If a kickback is a percentage of the money spent, then the people on the inside who are spending the money are incentivized to spend as much as possible because then they get back more.*
- KURIS: Yes.
- ODERO: *It is also very wasteful of the country's money because they then just give away a lot of money. So if what you are trying to do is to actually be cost efficient, you're pretty much going against the grain of the people who think in the old establishment manner. You are therefore pretty much upsetting the apple cart. It is an unpleasant business for all concerned. And believe me, they don't spare the attacks. You should have seen what they wrote in the press.*
- KURIS: Was it personal? Was it against you?
- ODERO: *Yes, of course. So I just take it. It can be relatively daunting because being calumniated and ridiculed and abused is generally not fun.*
- KURIS: And you volunteered for this? You didn't know you were walking into—?
- ODERO: *I had the idea that it was an important task and yes, it carries with it a certain cost. It is just one doesn't quite anticipate the actual personal cost in advance.*
- In any case we eventually managed to narrow down the field to three and placed orders. But now comes the important thing. You can't just use a computer and a webcam, you've got to write the software.*
- KURIS: Right.
- ODERO: *There were a whole bunch of innovations in the hardware, which are all very interesting, but I think one of the chief differences was the software. If we had gone with one of the proprietary operating systems, which shall remain nameless, it would have cost between \$99 and \$100 per unit. Unfortunately, it generally gets a whole bunch of viruses, so you cannot operate in an environment without putting on an antivirus.*
- KURIS: Right.

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ODERO: *Then that costs you maybe another \$20 and all the quotes we got for the voter registration software, just the front end, varied from between either \$50 to \$250 with different models or they were going to charge per person registered. I think the minimum cost we got was \$2 per person registered. At 75 million people, that's \$150 million dollars just for registration, just for software. We just said listen, we're not going to do that. We're going to go entirely open source and we're going to roll our own solution. There are multiple reasons why we did this.*

KURIS: Who came up with the idea of the open source software?

ODERO: *I did. We were going to build it ourselves. There are multiple reasons why we went this way. We were just about to invest horrendous amounts of public money in a voter registration exercise. The conception was that this would become the definitive list of adult Nigerians. We needed to ensure that it was useful for voting purposes, but that it also provided a larger utility to the Federation and people of Nigeria at large. It was therefore an investment worth protecting.*

*The commission would own both the infrastructure and the data and all copyrights without license and without being beholden to anybody. The only way to actually achieve that was to use open-source software.*

*You should have seen the hullabaloo, the brouhaha was beyond belief, it was astonishing, and everybody was up in arms. There are some companies that exist just because they get this large influx of election money every four years. To just simply snatch away over \$100 million of potential revenue going out there caused local vendors and consultants to go up in arms. I suppose in a very real way members of the international electoral support community said, look, this has never been done, you don't want to do this, and you're going to fail. They were utterly against it.*

KURIS: Wow, are you speaking there of just the industry or also the NGOs (nongovernment organizations)?

ODERO: *I'm talking of some NGOs.*

KURIS: Yes, I understand.

ODERO: *Some NGOs were utterly against it. It's never been done, you're experimenting, why don't you try this. They made a concerted effort to shoot it down.*

KURIS: Do you think they didn't quite understand it or there were other concerns?

ODERO: *They completely understood.*

KURIS: Okay.

ODERO: *But you see something like this changes the ballgame entirely. A democracy is an extremely expensive and inefficient thing to run. If you bring up new ways that radically lower the cost, it changes the entire dynamic. I think in a very real way there was institutional, intellectual and emotional repugnance at the change that was about to happen. But unfortunately, the chairman of the commission and some of the commissioners actually said this is what we're going to do, and they went for it.*

KURIS: Was it hard to convince them of that?

- ODERO: *Well, it depends on what they're interested in. The people who are particularly interested in just getting the job done understood. But some people obviously have commercial interests and they might resist. A case in point is our choice of open-source database. Consider just the cost of the database, we got a quote from one of the largest database vendors of over \$100 million dollars. Going Postgresql was going to take away from us a net total average cost of —wait for it—zero.*
- KURIS: Wow.
- KURIS: Would there be any challenges with this program, is it difficult to set up or use?
- ODERO: *No it is not. It is robust, reliable, and has high availability. It requires a little bit of knowledge to set up, but read a book, browse a web page, ask a few questions, and you get it done. But the vendor fought bitterly. It was like an all-out war.*
- KURIS: Did you have to strategize yourself, how you would communicate?
- ODERO: *Yes, yes. I mean the basic thing is to ask the company in the U.S. to give you a quote, and to wait for the local guys to give you a quote. Look at the difference. It is exactly the same thing. If one is bigger than the other, then it is padded. Padding is bad. If both of them turn out to be \$100 million, or one slightly more than the other, you say to yourself, look, compare this to that. It is not as if we were running anything particularly complex. It is a voters' register, it is a list of people. It is not an ERP system, it is not a major transactional thing. Even though it would run that well. But I mean, for goodness sake, this is a long list of people. It is a 75 million long list of people, that's what it is. Why would you go and spend \$100 million—preposterous. I mean, more than a dollar per person to just store a record in a database? It is ridiculous.*
- Anyway, so we went with Postgresql, writing the software for the voter registration with a small team of volunteers, including Femi and Shola, and a couple of really bright people, who were very focused and devoted. They all worked extremely hard. I restricted myself pretty much to just system architecture. They did most of the heavy lifting. This was a career-ending, nation-shaking gamble.*
- If we failed, if the thing did not work, if we lost data, I think that is pretty much the end of your career and it means you've got to do it again. That means you won't have your voter register in time, which means that you've pretty much brought on a constitutional crisis, and in a then rather fragile country that could have been disastrous.*
- KURIS: This is also like a test for the open-source movement in a sense right? I don't know if you thought that way. I mean this approach that you supported, if it didn't work out it would be the end of it right?
- ODERO: *The open-source movement?*
- KURIS: I didn't mean to make it so critical, but you believed that this was the right approach. If it didn't work out not only is that the end of your career, but it would also really invalidates the approach.

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ODERO: *It would invalidate the approach and it would put open-source software a step back in this environment. That would be pretty awful because I'm a big open-source fan, unabashedly.*

KURIS: Were there any security concerns with the open-source software?

ODERO: *Yes. A lot of people said listen, if everybody has the source code that means it is insecure. That is exactly the wrong way to think about it. If nobody has the source code, that is security by obscurity. If you think that you're secure because people can't see your code, all they need to do to break your system is see your code, and that can be arranged for any code on the planet. I can reverse engineer it in any of a hundred different ways.*

*On the other hand if what I've got is algorithmic or logical security, then you can look at the code but if you don't have my password, even though you know how it works, you cannot mathematically or logically break my security. So in effect, as Larry Wall says, "many eyes make bugs shallow." The fact that you're open about it also guarantees that you've got a securer product.*

*Of course people did raise this argument and when it was explained to them, I think they pretty much understood it but in many ways somebody really has to make the call. You cannot legislate what one plus one will be. It is a deterministic function of your model of the universe. It is not a popularity contest. We cannot all jointly agree—okay maybe we can—one plus one equals three. But I mean, if we are speaking the same language, we can't. So at the end of it all, if you can prove it in a rigorous mathematical or engineering-oriented manner, then most right-thinking people will come around to your worldview.*

*The chairman sought to create an environment where logic, rationality and common sense were principal drivers of decisions, with a complete emphasis on transparency in everything. That helped tremendously. So we went to open source. There was a hullabaloo.*

*Eventually—and now this is the crux of it—we knew from the get go when we shipped out—I mean these guys were going hell for leather trying to assemble all these 132,000 computers and we shipped them an image, which they were going to master on a hard drive so that when they delivered the computers, it would be pre-installed. It would have been an absolute nightmare trying to install software on 132,000 computers. So we sent them an image. But we were still working on it. Even the image was obsolete by the day after it was delivered, because we continued to work on the product and to enhance it.*

*Very early we recognized that we weren't going to be done any time soon. So we put in place something called a patching infrastructure so that you can change it in the field. By golly, I do not think we have ever had a more inspired decision because if we didn't have that, our geese would have been turning slowly on the spit by now. Our goose would have been cooked.*

KURIS: And the patching worked through wireless or through hardware, how did the patches work?

ODERO: *The patches were uploaded to websites. Everybody has a user name and password. They go there, download it, put it on a flash disk, stick the flash disk into the computer and switch on patch and boom, done.*

KURIS: So that was because a wireless system would have been more vulnerable.



ODERO: *Only about 47% of Nigerian's geography actually has GSM coverage. So those were other important questions. You're collecting all this data, how are you going to get it back? So here I am registering people on this computer, what happens to this data that I collect? Right? Now I'll come to that shortly. Let me tell you why patching was important.*

*When the voter registration exercise started on January 15<sup>th</sup>, it was utter pandemonium. One of our vendors had not delivered their quotient of 22,000 units. So it meant that our entire data aggregation strategy just collapsed out of the box. What we had intended was that a bunch of polling units would be organized into something called a registration area. We had intended that there would be one of these direct data capture machines at each of the polling units and one at the registration area. So that every evening these computers from the polling units would go to the registration area, transfer data and then go back to the field.*

*But when we kicked off without enough equipment, we didn't have enough for the registration area, which was a grave problem. So our data aggregation strategy pretty much collapsed out of the box. So we had to innovate almost on the fly, which is of course, a useful thing to do. But on the first day of registration, when I think ex-President (Olusegun) Obasanjo went to register, there was a problem with our fingerprint scanner. The entire country was watching. He put a thumb on it and it just wouldn't accept it.*

KURIS: Oh no.

ODERO: *What we had done was we had set the acceptance threshold at a very high quality level, which cannot be achieved outdoors because the ambient light was high and the total number of minutia points required was way too high. That only goes to show that if we had had a bit more time, we could have done field trials to test the thing. But we didn't have time. So immediately we became aware of this.*

*We looked at it, and overnight we had to update the software across the nation without a wireless or other network of about 100,000 computers. The machines worked and the patching infrastructure worked, but for the people operating them, it was their first day, and they were not properly trained. They were using this system for the first time. It took two or three days before we resolved the problem.*

KURIS: These were mainly the youth corps?

ODERO: *Yes, and some of them in far off riverine areas and mountainous areas couldn't even get to the Internet.*

KURIS: Oh okay.

ODERO: *So there is President Obasanjo attempting to register and he can't. That was a pretty frightening moment. In any case he was very statesmanlike about it. He said, "Look, maybe it is because his blood was dry, maybe it is because this—." He said a lot of nice things and said "There are always teething troubles when you start these things." By golly we got that thing fixed and done but the tension and stress in the commission was palpable. It was a terrifying moment. Once we got our patching done and were able to modify the software, we kept getting*

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*reports from the field about different problems. We'd build the solutions and ship them out, so on almost on a daily basis we'd be sending out updates.*

*Unfortunately, we had gone ahead and called our updates an old UNIX name called patch. Now patch-patch in Nigerian "pigdgin" means hastily and badly put together. So there was a small cultural issue in our use of the ancient and venerable Unix word patch. So when they say that this is patch-patch software, it actually conveys a sense of a jalopy.*

KURIS: So when that got to the media, it became something to be made fun of.

ODERO: *Yes. So we're giving out patches. In any case, all the different newspapers were asking why Nigerians should believe that this could be done. This fellow has not done it. Now he is ostensibly native Kenya, so this individual is using free Google software to do all manner of things. They did really try to libel, slander, malign and discredit me in order to ensure that this particular route was not followed. But the chairman and the commission stood fast, and we saw it through.*

*But that's the voter registration process. At the end of it all, as I said, our data aggregation process had collapsed. So we had to wait until the end to actually begin to roll in the data from the field, whereas it ought to have been every evening the data rolls in back to the center by stages. In this case, because we didn't have equipment when we started it also meant that as equipment arrived we had to deploy it to places that were severely underserved, until at the end of it all our entire architecture had been skewed. So we now had to wait until the end of the voter registration process to begin rolling back our data.*

*Fortunately there was very little data lost. But it meant that suddenly we were again under intense time pressure. An activity that we should have had 21 days in which to execute, we now suddenly had seven days, at the end.*

KURIS: To release the final list you mean?

ODERO: *Yes, you've got to get all the data together. You've got to run a preliminary AFIS (Automated Fingerprint Identification System) to weed out duplicates.*

KURIS: Okay.

ODERO: *I can tell you that precisely because we had issues on the first day of capturing fingerprints, a lot of people went through special registration, which is a facility we had put for people who might be physically impaired, or people whose fingerprints might be impossible to capture because they've got burns or scars or things like that. So a lot of people went through special registration, just to get through it because it was taking too long to capture fingerprints.*

KURIS: Is this why some people it took them a couple of hours to get through? It took them a longer time?

ODERO: *Yes. But eventually after two or three days we got it down to 3 minutes flat. But a lot of people on that first and second day went through the special registration process. Then because the only practical way of finding people who have registered more than once is by comparing their fingerprints, the directive was given that if your fingerprints haven't been captured, you need to go back. So in a very weird way, people who had registered the first time without fingerprints went back a second time and registered with fingerprints, and because they didn't*

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*have fingerprints the first time is nothing to compare so you won't catch them as duplicates.*

*This provides a very interesting challenge. How are you going to remove those duplicates of people who went back and hadn't captured their fingerprints the first time? Well, we made the presumption that their names would be either the same or sound the same. And we also presumed that their ages and dates of birth or approximate year of birth would not change dramatically and the pictures of their face would be about the same.*

*Most of this we can do with software at the backend, and we did. We found a whole bunch of duplicates, which you can't prosecute because it really was our fault. Now we needed to find people who actually registered as duplicates with intent to defraud the system. These people, we have got to find them, punish them, and use them as an example to deter any other such future things. We did find some, an odd 900,000.*

KURIS: Wow.

ODERO: *Now how do you prosecute 900,000 people? This I suppose is still a subject under discussion, how do we actually punish these people.*

*You cannot pick and choose, I'll punish person 43 and I'll not punish person 45 when I know about both of them and they're both guilty of the same offense. So you need to find some way to uniformly A) establish the guilt and/or innocence of each of these people and B) uniformly punish them all for committing the same crime. It is a monstrous challenge. I don't have the solution. I've got a couple of ideas, but no decision has been made.*

KURIS: If you find it I'm sure the music industry would be very happy to deal with all the copyright infringement. That's interesting. You presented these cases to the chairman and INEC is aware of all this.

ODERO: *Yes, yes. But you see with just software it is very hard to capture deliberate criminal activity. We'll leave that to the lawyers, that's their business.*

*Anyway, we managed to put all of that together. There were multiple amazing lessons that I took away from this. One, when you're going against the big guns, you have to absolutely be resolved and determined. Two, carry your boss along and explain very clearly what your intention is, why you think it is the right way to go and be the first to state the potential objections and your arguments against it and to show significant value.*

KURIS: Okay.

ODERO: *If you don't do that, when the big guns begin to thunder, they abandon you to your fate. I think the most important thing is that you need to succeed. If you lose, they'll nail you to the wall. You'd better win if you're going to go buck the trend. There is going to be a lot of noise and chatter, just hunker down and get on with the work; ignore the noise. I think that is how to go about taking on the establishment if you're acting from within.*

KURIS: Did you have any other kind of allies you could look to, like international or domestic? Did you have any kind of support in terms of the technological innovations you were making?

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- ODERO: *Are you talking about technical?*
- KURIS: Yes, not emotional support. Were there technical people either in other countries or here supporting you?
- ODERO: *I have seen user groups on the Internet; there is a great deal of support and a great deal of help. A great many Nigerians both within Nigeria and in the diaspora volunteered their expertise, time, thinking, and effort in order to do this. For instance, I'm not a biometric specialist. A Nigerian from the diaspora who has a couple of Ph.D.'s in fingerprinting and biometrics gave three weeks of free consulting on how to parameterize everything. In fact I need to remember his name, a truly great guy. He just came in and gave us three full weeks.*
- KURIS: How did you find him? He was on the Internet?
- ODERO: *Yes, and he just volunteered. We had to dimension it. Apparently, if you are somewhat light skinned, it is somewhat easier to capture a fingerprint than if you're dark skinned because apparently the transparency of your skin is slightly different. So the fingerprint capture characteristics also change. So whether you use a blue light or a red light, depending on which it matters. Unfortunately nobody makes fingerprint scanners in Africa, where we're predominantly black. They're all made in places where people are predominantly lighter skinned. So they are parameterized to that particular user group. So we had to do image enhancement, manipulation, and contrast.*
- KURIS: Okay, we're back.
- ODERO: *This is Africa's largest single IT project ever. Let me try to dimension this for you. If I took the DDCs, that's a direct data capture machine, and I laid them end-to-end, it would form a chain over 87 km long. That means it would take you four days to walk it. If you look at the armies, Nigeria has an army of about 100,000 soldiers. Ghana has I think 12,000 or 20,000 or something. But if you add up the armies of all West African countries, it comes up to about 215,000. We employed 240,000 people as registration agents. That means we deployed in essence more manpower than the entire militaries of the region. We captured 75 million fingerprints, 75 million people's data, 73 million are unique as we had those duplications. But that's 73 million, that's 3.5 times the population of Ghana. So it is really one of the largest projects Africa has ever undertaken.*
- I'm happy to report it was designed, developed, executed and supported purely by Nigerians. So in a very real sense Africa is coming of age and this is part of what we hope to achieve, to give people the confidence to do it themselves. Our people can do it.*
- KURIS: So how did you find the youth corpers, because many youth corpers were doing this work, right?
- ODERO: *All of them. How did we find them?*
- KURIS: Sorry, were you happy with the work they did for you?
- ODERO: *Yes, brilliant folk. When you see young people actually dedicate themselves in extraordinarily difficult conditions, with an ungrateful public, in the hot sun, and the equipment doesn't always work and they've got to deal with increasingly irate crowds, you again have hope in the youth of Nigeria. They departed themselves*

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*with honor and gallantry. It is absolutely heartwarming. They did a tremendous job.*

*and we're all very proud of them.*

KURIS: I have found that the youth of Nigeria really are the story of this election. The good parts in terms of the youth corps, and also the violence and also some of the worst parts too. But really it is almost like the main character in this story is the youth of Nigeria.

ODERO: *Could it possibly be any other way? It is not possible, because we have a substantial youth bulge. The vast majority of our population is between zero and thirty. So Nigeria is a story about youth. It doesn't matter who leads, who appears to lead, it is really a youthful story. But come the elections, I don't know if you have heard enough about the voter registration. I mean there were a whole lot of lessons learned. We've put a complete narrative of every negotiation with every vendor and decisions made, policies taken, negotiating stance that they took, everything – including characterizing the persons. Obviously when we were going into these negotiations I did my homework, sat down, read up on their culture, tried to understand their bargaining position, the best alternative to a negotiated agreement. We worked it out like a mathematical puzzle.*

KURIS: Is this narrative online? Available?

ODERO: *It is, it is on our website.*

KURIS: The INEC website?

ODERO: Yes.

KURIS: I hope you can talk to the Harvard Negotiation Project.

ODERO: *Come the election we had put all this technology in place. We obviously wanted—let me use a slightly politically off term— reactionary forces who were going to resist change, counterrevolutionaries if you will. We needed to ensure that their fiendish plots were stopped cold in their tracks. Now I'm totally mixing up my metaphors.*

*The one thing you have a lot of in elections it is voters. There are more voters than anything else or anybody else. So in order to be successful you must enlist the voters in trying to secure the election and ensure that it is free and fair. Let me also just go back briefly to the voter registration. You see I'm sitting on the same side of this table as you.*

KURIS: Yes.

ODERO: *It makes talking a lot more comfortable, I'm open, you can see me, I can see you. There isn't this whole artificial edifice between us. This is called non-adversarial seating. During the voter registration process, we ensured that there was non-adversarial seating. It is not that I sit on one side of the table and then the person being registered sits on the other side of the table in which case it would be INEC doing something to the people. We had them sit on the same side of the table where they could both see the screen, and we designed the software so that it is actually for the person being registered. That is really the focus. So you can see*

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*which finger we want to scan next. You can see your name being typed in. So you're sitting on the same side, non-adversarial. It had multiple advantages.*

*One, people felt part of the process. Two, and this I think is more important, because they were part of the process they were more forgiving and more cooperative and three, the quality of our data was substantially better because the person whose data is being entered is looking at it being entered and can immediately correct anything.*

KURIS: Oh yes.

ODERO: *It also led to dramatically improved picture quality because people would look into the camera. If they don't think it is a really great picture of themselves they'll say take it again. So essentially non-adversarial seating had a tremendous impact on our data quality and hence the quality of our voters' register. It may seem a trivial, inconsequential change, but look at the impact it had. So that is all part of the theory of carrying the voters along.*

*Carrying the voters along both between voter registration and elections we needed a way of intensely involving the electorate in our thinking, in our decisions, and in supporting and securing the process and in protecting their mandate. So quite clearly we needed to use the Internet, but the Internet isn't that pervasive yet. So we set up a Facebook page for INEC. We set up a Twitter account. We used everything we could. A lot of young people in Nigeria carry Blackberries, so I donated my Blackberry number to also become part of the method of communicating en masse.*

KURIS: Using Blackberry messenger?

ODERO: *Yes. The Blackberry of course collapsed almost instantly. We put it on our website, here is our Blackberry pin. Within one day the Blackberry collapsed completely. It must have had more people than the social network. We had more people on the Blackberry than on Facebook. Within two days I think I had over 100,000 people trying to join, to make friends. On Facebook we may have hit 50, 60, maybe 80,000.*

*At one point you couldn't even type. Eventually we worked out a way in which we could connect a keyboard to the Blackberry. We had to just rejig it, and sew the keyboard on, just so we could respond.*

*Then what you would do is you'd switch it off, and then switch it on. You'd paste your messages and send. Then immediately after that it is inundated.*

KURIS: What were all these people talking about? What was all this feedback?

ODERO: *When is this happening? Have elections been changed? There was a whole issue of people asking if they could carry their phones to the polling units? I mean the commission and eventually the police answered that you can. But there had been some rumors that it was going to be said that you could not take your phones, which would have been terrible because we expected to get a whole bunch of reports by SMS. We wanted people to take pictures with their phones and e-mail them. We wanted people to submit reports from the field and to make every person a part of securing this. So if the position on phones had been you can't take them, it would have been a catastrophe. In any case, phones were allowed.*

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*Over the election period, I think we must have received hundreds of thousands of SMS's. In just pure texts, it came up to well over 3 gigabytes of just text messages.*

KURIS: Wow.

ODERO: *Just pure texts. We also sent out a whole bunch ourselves, but you see we had made a very clever move. When we were registering people we asked them for their phone numbers. So at the end of the day, when the elections were going on, we could always select a random selection of voters in any polling units and call them or send them SMS to ask them questions.*

KURIS: Wow.

ODERO: *So if somebody sent in a report that there is rigging going on at this polling unit we could call five or ten random people of both genders and of different ages and say, "Could you tell us about what is going on there? Where are you? Can you hear this? We hear this, is this correct?" We could actually develop intelligence.*

KURIS: Wow.

ODERO: *So much so that in different cases, I think this is called open source inventory tracking. We could actually follow particular balloting materials, sensitive materials, by people sending us SMS where they have seen it. "We just saw this truck, we just saw this truck. He is here, here, here." So without actually having GPS installed in all these things, we could pretty much track everything. People did amazing things. I'm sure you might have seen a lady voting multiple times on YouTube. That's just some guy out there who is holding his phone in his pocket with the camera out taking this. It happened over and over and over again. I mean we set up something called the situation room.*

KURIS: This is the INEC situation room?

ODERO: Yes. You might have heard about it.

KURIS: Yes.

ODERO: *We had a very simple theory. We had inbound messages from multiple sources which is SMS, social media, inbound phone calls, all manner of things. Just take TV, radio, all public domain intelligence sources and we bring them all in, record them, analyze them, prioritize them, correlate them, hand them to a secretary to make a decision and we would liaise with the security agencies and also with INEC leadership and we'd get instructions and commands to ship them, format them and send them out appropriately as orders.*

*I think we rescued 34 people who were kidnapped on Election Day.*

KURIS: Wow.

ODERO: *We lost about 8 people killed, youth corps people. I mean the total number of people who were caught "attempting to rig or to do ballot snatching" must have been in the hundreds.*

KURIS: So you coordinated this with the police and security forces?

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ODERO: *Yes, we had liaison officers with them. But I think what you're interested in is the technology that was used.*

KURIS: Yes, because I've been talking to other people about the other areas.

ODERO: *For SMS receipt we used something called Rapid SMS, which did yeoman service. We also wrote a whole lot of other stuff to do the collation, correlation and prioritization and also to ensure that this stuff doesn't get lost. But we also had a great many other volunteer teams. For instance, from Enough is Enough and from Reclaim Nigeria, we got over 30 or 40,000 messages about what was going on.*

*Unfortunately the Ushahidi platform that they used makes the reporter anonymous, and not everybody knows how to report. But in the few cases where we were able to determine that this report by some anonymous person is being made from such-and-such a place. We were able to very rapidly develop intelligence about the actual situation on the ground and also to design interventions and monitor their effectiveness and execution.*

*We also developed and deployed an electronic vote collation system. to find out whether or not the results we were seeing were sane because we were getting results straight from the polling units. I had hoped that we could get just random citizens at the polling unit to report but, well, it didn't work that way for many reasons. That's a particular battle we didn't win. Well it's not that didn't win. We were told to test it, but the test was designed in such a way to be utterly meaningless. You can't win them all. That I think is the lesson that you can take away from this.*

KURIS: Are you already working on the next battle? Are you working on how to improve the system for future elections?

ODERO: *Yes. There is obviously much more ahead—this was just one of many exercises. There was this grand, massive, voter registration exercise that happened. We have now got to establish and support a continuous voter registration process, which starts off on the first trial on the 6<sup>th</sup> of this month in Kogi state. We are actually for the first time in Nigerian history going to follow the law and have continuous voter registration. So everybody who turns 18, we hope they will come forward and register. People who didn't register the last time can now come ahead and register. So that is one of the things they are trying to do.*

*There are a whole lot of what we call little projects that need doing, such as inventory management and document management. We have to conform to the Freedom of Information Act. We have got to develop an automated way of publishing results. There is a whole list of 20 or 30 other little projects that we are going to do with open-source software. We are an open-source software shop.*

*There is training to do. There is all manner of administrative backstopping, filling out, and optimizations to be done.*

KURIS: It seems like your approach is integrating technology with many other departments of INEC.

ODERO: Yes.



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KURIS: So how is that working? How do you work with the other departments to make sure everything is working to be optimized?

ODERO: *Historically government agencies have embarked on many massive, expensive, white elephant projects. And the large reason is because there is a financial incentive to have it really big and be really expensive. Also, precisely because the focus of the person issuing the job or issuing the contract is generally focused on the money, there has been very little time to actually do the thinking about how it works and how it fits in with everybody else.*

*Once you remove that incentive and it becomes purely an operational matter, and it becomes purely an optimization matter, without any financial implications or consequences, you tend to find that one, the people contribute as they are actually interested in whose lives it will improve, and two, animosities because of who is holding on to the thicker side of the wedge disappear; and three, you can roll it out relatively quickly because there isn't that much oversight, as there's no money involved. So open source is good in many ways.*

*So how do we work with other departments? In a civil service manner—get the director of ICT (Information and Communication Technology) to talk to the director of that. Get the formal committee to discuss and reach a resolution, which might be to buy licensed software. You kick out the bit about licensed software, about spending large amounts of money, or going off for retreat, then you've got the job done.*

KURIS: So you have committees with different departments?

ODERO: Yes, yes.

KURIS: Were you inspired by the examples of other countries in any of these reforms you are doing or maybe by other ministries or other sectors?

ODERO: *I've always been not quite a zealot, though I've heard myself called an open-source zealot. I knew what needed to be done, but the approach I took I think was particularly Googley, which is scrappy. Whatever you've got make it work, make it happen. Pretty much think hard, work hard and don't lock yourself down in analysis paralysis. Trust yourself, trust your instincts, confer and keep thinking. Iterate, iterate, iterate and fail early.*

*I think this general Google attitude, approach, mentality, system, was particularly instrumental in getting some of the stuff done.*

KURIS: Did you talk to colleagues in electoral management boards in different countries? Did that help at all?

ODERO: *You know, we didn't have any time. But at the end of the voter registration process I must say, the commonwealth election management bodies held a meeting in Bangladesh. A host of different countries, I think about six were there to show experiences and establish electoral best practice. I participated in that, and it was very refreshing to see yet more people who don't agree with this approach, by and large.*

*The smaller island nations of the Caribbean tended to just outsource to some American company. They'll sort that out, there are so few anyway.*

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KURIS: Yes, Guyana feels that they just don't have enough—.

ODERO: *But Bangladesh rolled its own solution. Invariably in every case where there has been a successful voter registration process, I think the general consensus was that the only time it ever works is if you roll your own solution. So if you're going to try to get some offshore company to build it for you, I think the general agreement is it doesn't work. Because I suppose they're not vested to the same degree, nor do they have that intrinsic feel for what is called for and what the exercise would be like that a local would have. So roll-your-own solution I think pretty much is the way to go. And what better way to roll your own solution than using open source? Software is free. Take it, tweak it, re-jig it, rebuild it or dump it. But it's out there and it is available for all of the African countries to use and other African countries are beginning to take it up, so this is good.*

KURIS: So you hope you're inspiring other African countries.

ODERO: *There are a couple of countries that have come for study tours. Most notably Kenya came and spent ten days looking at how we did it. Hey, it's free. We're more than happy to share our knowledge and experience and expertise and insights, and we're doing it in an open source way. It's free and it's open and you can take it or you can leave it or you can tweak it or you can change it, but African democracies and electoral management bodies now have a starting point. Nigeria has once again reclaimed itself and become indeed the big brother that it ought to be and made some of the investments that other African countries cannot make and taken the risk that I'm sure would petrify many another electoral body and tested it on the largest possible population – 75 million registered voters is more than most countries' populations.*

KURIS: You probably have to go back to work.

ODERO: *Oh yes, I have a 4 o'clock.*