Interactive Voice Response: Its Growing Role in Agricultural Extension Services

Audio Transcript

April 14, 2016

PRESENTERS

Rikin Gandhi, Digital Green

David McAfee, Human Network International

Neil Patel, Awaaz.De

CONTRIBUTORS

Judy Payne, USAID (Moderator)

USAID Agrilinks: Hello, everyone, and welcome to today's webinar, "Interactive Voice Response: Its Growing Role in Agricultural Extension Services." My name is Dana James, and I am a Knowledge Management Specialist with the Feed the Future Knowledge-Driven Agricultural Development Project, and I'm a part of the Agrilinks team.

We're very happy to have Judy Payne, the ICT advisor with USAID's Bureau for Food Security join us as our moderator today. Judy helps USAID Missions, projects, and implementing partners around the world use information and communication technologies as a tool for sustainable economic growth and scalable ag development solutions. Judy will briefly set the stage for today's presentation, and then we will introduce Rikin, David, and Neil, our speakers for this talk. So, Judy, I'll turn it over to you.

Moderator: Thank you, Dana. This is Judy, and as Dana said, I work in ICT for USAID and our implementing partners and also any other folks out there that are using information technology to improve access to agriculture information and improve productivity for poor farmers.

Today, we're going to be looking into a topic called interactive voice response: IVR. It's a type of service that Americans actually hate because we all think of it as a way that we can't get to customer service in any of the businesses in the U.S.. We call in a number; instead of hearing a person we hear some recording that says, "Your call is important to us. Dial 1 for your account number, et cetera." But it turns out that IVR has great qualities and actually much more capabilities than I knew. And so, I've been watching it and learning about it for the last couple of years. And so, this webinar is an exciting one for me because we can get the word out to others and start sharing our experience on what works with IVR and how it can be integrated with other digital tools for agriculture.

Today, I think we have the three best speakers I could think of to speak on the topic. Rikin Gandhi will go first, and he's the Chief Executive of Digital Green. You all may know about Digital Green for its low-cost video technology. They're using it well in Ethiopia, India, Ghana, and many other places now. You may not know that Rikin also is working very closely to integrate various digital means into public extension services in Ethiopia and India and elsewhere, and integrate low-cost video with IVR. So, he'll speak about IVR options and how he's using it.

Our next speaker will be David McAfee. He runs a company called Human Network International – HNI. I first met David when I heard about his 3-2-1 Service in Madagascar, which has now taken off and is being rolled out in 15 different countries in Africa and Asia. He has a really interesting and compelling model partnering with mobile network operators, and trying to milk as much as he can out of IVR to help poor farmers. So, I think you'll enjoy David's remarks.

And finally, Neil Patel is joining us. He's the co-founder and CEO of Awaaz.De. You can see his resume here. What I know him as is a fellow that has essentially an IVR system on steroids. He'll describe various capabilities that I never thought would be part of IVR systems and that he's now integrating into an IVR system for the country of Ethiopia run by its ministry.

So, let's start with Rikin first. Rikin?

Rikin Gandhi: Thanks, Judy. As Judy introduced, interactive voice response systems are – have a lot of different types of features that they're able to provide for agricultural extensions. And I'd say that we're just at the beginning of being able to experiment with a number of them. For us at Digital Green, as Judy mentioned, we've primarily focused on using video to support existing agricultural extension systems. But we've found a lot of value in partnering with various service providers who have been involved in leading the creation of interactive voice response systems to enhance these services. And we think that these same services could help other organizations who may or may not already be using various types of information and communication technologies.

And some of those features of interactive voice response that are unique and that are – that provide additional value on top of an existing agricultural extension program are, first, that it is voice-based. So, it only relies on the most basic feature phones to be able to be used. It just requires a phone call to be able to be accepted by a phone, which of course is the most common feature that all phones, and for interactive voice response to be accessible.

It also makes extension – not just the traditional top-down style of extension, of a one-way flow of information – it permits individuals who receive these calls to also call back and be able to ask questions and leave feedback and save their recordings as they interact with this knowledge, while at the same time being able to both blast out messages to individuals across all of their phones

that might be common issues that you might want to share to many farmers simultaneously instead of having to engage with them individually or to call them individually one by one. While at the same time being able to make those messages targeted to different types of farmers based on their phone numbers, which could be linked to the geographies in which they're based or could be based on the types of commodities that they're involved in growing. And that targeting can be grounded in the data that farmers may have already provided in terms of registration information of where they're located and what commodities they're interested in. And that data can kind of be paired with the targeting of these messages.

And finally, it's not just that these messages have to be fully automated. There's a great advantage of an efficiency play that interactive voice response, or IVR, is able to provide because you can have these prerecorded audio messages that can be sent out to individuals at the same time. However, at the same time, these IVR systems can be linked to human services, where you can pass on an automated phone call, for instance, to a human call center that could allow for a real time, two-way discussion or a conversation with an individual who might be on the phone line.

So, there's a lot of different types of features that interactive voice response allows that essentially allows for extension to move from its top-down, single direction, broadcast style, information messaging approach to a more interactive or targeted knowledge exchange type of system.

The way that we think about extension systems in general at Digital Green is that you start with the farming community. There's various types of social organizations that exist at a community level, and those are farmer clubs and farmer groups to women's self-help groups and mothers groups, all of whom might be involved in various types of agriculture and nutrition-based information sharing.

At the same time, there is these extension systems of government, of nongovernmental actors, of private agribusiness, who is involved in linking these social organizations of farmers together and providing a front line cater of extension agents or lead farmers or others who are oftentimes involved in mobilizing and strengthening these farmer organizations by sharing information in the form of demonstration plots, farmer field schools, and other types of extension approaches. And then, there are all of these information communication technology approaches that serve as a

layer on top of what these extension services are already doing. Sometimes, these digital technology services are disintermediating these extension systems, but oftentimes they are strengthening the extensions systems that are already out there. And that's where we find the most success and the most – the greatest opportunity to be able to boost their efficiency and their effectiveness through various types of technology-enhanced approaches to extension.

And so, with interactive voice response in particular, the types of features that we found to be most effective have been features like being able to broadcast messages to a large population of farmers simultaneously. That could be based on the registration of these farmers at a particular geography or of producing a particular type of commodity. And that might be involved in being able to inform all these farmers at the same time about, say, an outbreak related to pest or disease issues. Or, providing a call center functionality to be able to allow farmers to have a help line, a human base of individuals, of experts who may be able to respond to these communities' individual concerns.

There's also an opportunity to use interactive response for more two-way types of discussions. Sometimes, it can be more to create feedback discussions in the form of question and answer discussions between farmers and the extension agents that might be serving them. And also, there can be opportunities for creating fora between the farming communities themselves to answer questions by one another, and even for the extension agents themselves to be able to have an almost virtual community of practice, to be able to share information between these oftentimes dispersed and individual extension agents that are scattered across a country. To be able to have an opportunity to connect with one another and share questions and receive support from each other.

And finally, there's also this opportunity to use all the data that is collected from an interactive voice response system, as you're able to record what individuals are listening to which messages for which duration, and which of these messages, for instance, is most popular, or what are the questions that folks are asking? And of course, you can also ask questions yourself by running surveys of farming communities to be able to have them respond about what parts with the extension system do they find most engaging for themselves, or what practices that a given extension system promotes do they actually adopt? And that data and that feedback that is collected, whether it is through a purposeful, conscious sort of collection process through surveys, or if it's just done sort of in the background as you're just logging data from the interactive

voice response system can be used to create performance management systems for the extension agents themselves to be able to evaluate: How is the extension system ultimately providing value to farmers at the ground?

And what we see this interactive voice response system set of features providing is an enhancement on top of the existing extension systems that already exist, and being able to serve as complementary to these other channels of ICT that could also exist in close integration with the use of IVR. In our case, we use video and also radio in some of our, some of the work that we do with public extensions systems in parts of South Asia and in Sub-Saharan Africa. And these tools of ICT provide maximum value when there's integration across them and where you're able to share data, for instance, across multiple channels of ICT to make each of those channels much more targeted and much more efficient for being able to provide value to farming communities.

We've worked as a practitioner extension provider together with our partner extension systems in various geographies where we work with other interactive voice response providers because oftentimes you could go out and produce an interactive voice response system, but it is a huge burden from a technology development perspective to be able to do that from scratch. And there are already a number of service providers that we'll hear about today from Awaaz.De – Neil – as well as others who are on the line with us on this webinar who have already developed a large stack of functionality for interactive voice response that we can all use to be able to provide custom solutions for the various types of agricultural extension programs that we're all involved in.

So here, on this slide we've just highlighted four providers – Exotel, Awaaz.De, VOTO, and engageSPARK – and compared some of the key features. Some of the key features in any interactive voice response system are things like being able to broadcast messages to a huge pool of farmers that you might want to reach out to, being able to allow those that you send out messages to to be able to give back feedback and be able to record that, and allow these individuals who are interacting with the interactive voice response system to do so using various types of voice and/or touch tone keypad entry sorts of modes of interaction. And for most of those basic features, all of these interactive voice response service providers provide that feature set.

But there is more variation when it comes to the level of customization that is possible across each of these systems, and

some of them have more – require more advanced technical input when you're trying to create, for instance, a more dynamic type of calling system or being able to have different types of prompts that might be in different languages and that might have different tiers of having – of a user being able to interact with the system. But – and so, some of these service providers are geared primarily for an audience of techies who might need to do this customization with a web-based user interface or might need to use an API to be able to customize some of their services, while some of them are much more easy to customize through a web-based user interface and without having to get into the code itself.

And so, there's variation across each of these service providers. And there's also differences with regard to their reach and, to some extent, some of their costing. But their costing is largely dictated by the local mobile telecom operators that each of these services partner with to be able to provide access to them. And so, there's going to be variation that is based on per-minute cost, for instance.

But – so, that's just a snapshot to give you a sense of the various types of core features and advanced features that each of these service providers offers. And you'll hear more about some of them, especially Awaaz.De, later in this webinar. But with that, I'd like to thank everyone for this opportunity to participate in this webinar and hand over to David.

David McAfee: Rikin, thank you again for that explanation on IVR. It was really well done. So, I'm here today representing a consortium of organizations who have worked together over the past six years on social and behavior change communication and community engagement projects. I'm the President and CEO of Human Network International. HNI's mission is pretty simple; it's pretty straightforward. We want to help other organizations and individuals to use technology in innovative and sustainable and productive ways. So, we really think of ourselves as capacity builders. So, we're not an agricultural organization. We're not a public health organization. We really just focus on technology. Our headquarters are here in Washington, and we have offices in about 13 countries now.

But basically, we wake up every day and we think about how to squeeze more productivity and efficiency gains from mobile phones, because the reality is that there are more phones on this planet than people now. And it may be – the mobile phone may be the first new behavior change channel maybe since the television. So, we've got a really great opportunity now.

I'd like to talk today about one of our initiatives. It's called the 3-2-1 Service, and it's an initiative to really help isolated people in the developing world to get access to information on an on-demand basis. And I really want to emphasize that on-demand part because those of who are on this call today, we're lucky. If we have a question, we can get a pretty reliable answer thanks to search engines like Google. The people in the developing world, they need access to on-demand information perhaps even more than we do, but illiteracy and lack of Internet access isolates people.

So, in response, we developed what we call the 3-2-1 Service, which we think of as a search engine where there is no Internet. So, the government of Madagascar, Airtel – our telecom partner – and HNI, we first launched the 3-2-1 Service in Madagascar about six years ago now – in March of 2010. So, here's how it works. So, if you are in Madagascar and you are among the 3.5 or 4 million Airtel subscribers, you can take your own phone and you can call 3-2-1 – a toll-free short code – anytime, anywhere, and this is the welcome message you will hear: "Thank you for calling the 3-2-1 Service, a new service that provides you with useful information. You can call this phone number for free 10 times each month. After the 10th call you pay just $0.04 for each call. You have eight choices. Listen closely to these subjects, then make your choice. Would you like to know about gender? Press 1. Health: 2. Agriculture, microfinance, water and sanitation, land title, family planning, emergency preparedness. If you have questions, comments, or suggestions about the 3-2-1 Service, please call the toll free number. If you want to hear your choices again, press the pound button."

So, 3-2-1 is what we call a pull channel. It means that farmers proactively choose their own time, place, and subject to get information, just like we use Google. So, the way we think of the 3-2-1 Service is that it's a little bit like a stool with three legs. So, the first leg is scale. The second leg is sustainability. And the third is impact. And obviously, all three of these legs are important, because without one of them, the stool really falls over.

So, let's talk about scale first. So, since the launch of 3-2-1 back in 2010, we've had about five million unique callers in Madagascar make 60 million information requests. We've also recently expanded the 3-2-1 Service to Malawi in October of 2014. And on this slide you can see the agricultural menus. So, callers make three decisions to get to the key message. In this example, the caller chose "agriculture," and then "soya," and then "planting."

You can see the various topics in that last menu follow the agricultural calendar more or less. Each key message is then about a minute long, which equals about six to eight full sentences. Messages can either be static in nature, like "Malaria is caused by mosquitos that bite at night" – once you put that message up there, you don't need to change it; it's static and thousands of people will listen to it every month – or, the messages can also be dynamic in nature, such as crop pricing, that often change on a daily basis. So, as Rikin mentioned, even – a big advantage of IVR is the fact that even illiterate audiences can benefit because they're simply listening to prompts and messages and then choosing a key message then to listen to.

So, the great thing about ICT projects is the information or the data that you can collect. We use VOTO Mobile's platform to organize the content, and then also to visualize the data for the callers. This is an example of the dashboard of the 3-2-1 Service in Malawi. So, we know lots about our users: their telephone number, the time and date stamp, the choices they make at each menu, the key message that they listen to. We even know if they listen to the entire key message or if they hang up somewhere in between.

So, this dashboard covers the time period from the first of October to yesterday – so, it's about six and a half months. And you can see in the upper right-hand corner we've received during that time about 3.3 million calls. So, that averages out to about 500,000 calls per month, or about 17,000 per day. Now, remember, we're talking about Malawi here, with a population of about 22 million people. Airtel, who is our partner in Malawi as well, they have about three million subscribers.

So, the pie chart shows the menu choices of those who remained on the call, and you can see that "agriculture" plus "weather" equals about 70% of our callers. So, as you may know, in Malawi at the end of last year the rains were very late, and smallholder farmers were very interested in the forecast, which really drove usage. You can also see we've received about 278,000 agricultural calls. That's coming from about 100,000. So, again, we believe we're attaining scale.

So, I'd like to talk a little bit about our relationship with our telecom partners because this speaks to the second leg of our stool, which is sustainability. So, our telecom partners own the 3-2-1 Service. And at the beginning, we propose a certain trade. We propose free content. We give the content to the telecom provider if the telecom provider agrees to provide the information free of

charge to their subscribers and to promote the service. So, our goal is to make the 3-2-1 Service available on all phones in a country like Malawi.

But this is a pretty new idea in terms of trading free content for free distribution. So, to get started, we sign an exclusive agreement with one telecom in a country, but we hope that over time we can actually spread that 3-2-1 Service to all telecoms in the country because we time bound the exclusivity with Airtel. It's one year or two years, and at the end of that period, then we're going to work to make the 3-2-1 Service available on all phones.

So, in terms of our standard agreement, the telecoms cover the two biggest costs: the marketing of the service and then all of the traffic – and by traffic, I mean airtime minutes. Our telecom partners, they agree to make the content available across four different channels – so, IVR, voice, which we've been talking about, but also to make the content available on SMS and USSD for literate farmers. And then, they also agree to zero rate our website – 321online.org – which is really useful, especially for agricultural extension agents, because organizations can create simple training videos, make them available on our website, and then 50 or 500 or 5000 agricultural extension agents can download those videos and use them offline in the course of their work.

In order for the 3-2-1 Service to be offered as a sustained service, we have to cover the third cost, which is the creation of the content. And that's an ongoing expense, and we do this in a variety of different ways. So, in essence, we run the 3-2-1 Service as a B2B model, as a business-to-business model, and we essentially sell space on the 3-2-1 Service. So, we approach implementers working across the various development sectors and we ask them to consider spending some of their communication budgets to put their messages up on 3-2-1 as a complement to some of their more traditional channels, such as radio and television and even interpersonal communications. Once traffic volumes increase, we also sell sponsorships. So, an example would be "This month of the 3-2-1 Service is brought to you by Colgate toothpaste. Brush your teeth with Colgate." So, that's another way of generating revenue, which can then be used to refresh the content on a regular basis.

So, we launched the 3-2-1 Service in Madagascar and Malawi independent of donor funding, and now, six years later, the telecoms continue to offer the 3-2-1 Service to their subscribers, so we really believe this speaks to the second leg of our stool, which

is that sustainability leg. And I would really encourage everyone on this call to think about ownership. When we create these services, who owns them? Because ownership is important, especially after your funded project ends.

So why? Why would Airtel consider giving away the equivalent of something like 40 years of airtime? When you add up all of the airtime minutes, it comes to something like 40 years of airtime. We estimate that Airtel contributes about a million dollars in traffic costs for the 3-2-1 Service every year. And the reality is that despite the fact that it's free to their subscribers, to their end users, the 3-2-1 Service actually makes our telecom partner money. It's what they call a sticky service. It helps their – it helps them retain their own subscribers and basically steal from the other guy, because the telecom market in the countries where we work, it's extremely competitive, and any edge the telecom companies can get, they want to take advantage of.

So, these are some statistics from Madagascar. We also see that people eventually start spending more money on phones. So, ARPU is the average revenue per user. We see that 3-2-1 users are more loyal. *Churn* means that they get tired of their telephone company and switch – so, we see decreases in churn and increases in revenue. But the statistic that I'm most pleased with is the subscriber-based penetration: Somewhere between 7% to 10% of Airtel's subscribers use the 3-2-1 Service every month.

So, here's a map of our expansion plans for the 3-2-1 Service. We have signed deals with the telecoms in these 13 countries, and together they have a combined subscriber base of about 100 million people. So, if we can maintain our 7% to 10% user rates, we could realistically have 10 million 3-2-1 callers each month by the end of this year. We're soon going to be adding additional countries. Last month, I was in Afghanistan negotiating with the telecoms there. We're also adding Haiti, Rwanda and Senegal in the short-term.

So, I mentioned our three-legged stool. The third leg is impact. And we've gotten some very positive feedback from call back surveys. Just to give you an example, in Malawi 96% of women said that the 3-2-1 Service added value to their lives. But to date, our research hasn't been rigorous enough. We think that's about to change, however. We recently won a Grand Challenge Exploration grant from the Gates Foundation, and we're also among the finalists for the Saving Lives at Birth, a Grand Challenge for Development grant. Judy has also recently put me in touch with the

Poverty Action Lab at MIT, so we believe that we'll soon have the resources required to conduct much more rigorous impact evaluations.

So, in terms of integrating the 3-2-1 Service with extension services, this is a huge priority for us. All of the ag messages in Malawi are written by a local content committee that's chaired by the Ministry of Agriculture. And we're adding an audio jobs aid section to the 3-2-1 Service for agricultural extension agents. So, for instance, agricultural extension agents, they would call the 3-2-1 Service and they would hear "Press nine if you are an agricultural extension agent," and here we would create a special menu for the ag extension agents themselves in terms of reminders and audio job aids and just as a way of communicating with hundreds if not thousands of agricultural extension agents simultaneously.

And again, Judy has been a big help to us in terms of layering on this ICT aspect to agricultural extension work. HNI is a partner in two new alliance ICT extension challenge grants in Malawi and now in Mozambique, where incorporating ICT into agricultural extension work is really important.

So, in terms of next steps, we want to make the 3-2-1 Service much more responsive to the needs of each individual farmer. The information we have on 3-2-1 is still pretty generic; we'd like to offer each farmer his or her own specific information. We're starting to do that now. At the end of each key agricultural message we sign post to other resources. So, for instance, the farmer would hear, "If you'd like more information on this topic, go here." For instance, if there's an agricultural call center, we can link the farmer automatically to that call center. We also give farmers the option of pushing a button to opt in to receive push messages or even robocalls for additional information on a topic of their choice. For instance, if they're interested in crop pricing, farmers can select the market and the crop and then get automatic SMS pushed to them for free.

But the big push we're going to make in the next year is to really personalize the service. And by that, our big push will be user-generated content. So, I'd love to be able to give farmers the ability to explain that they have a product to sell – for instance, 50 tons of potatoes – to give them the opportunity of leaving a voice message on 3-2-1 in an effort to connect sellers and buyers. I'd also like to give them the opportunity of creating various forums – so, "I have a particular problem with little red bugs on my potato plants. Can

somebody help me with this?" And then, finally, we're really interested in providing individual advice. So, a farmer puts in his crop or her crop, the planting date, and then, based on the number of degree days and the upcoming forecast, we would push the farmer recommendations about the use of fertilizers, and then the optimal time to harvest.

So, these are some of the ways that we're using the 3-2-1 Service in countries to help with agriculture and other topics that are important to farmers, such as offering weather forecasts and even early warning alerts.

Thank you very much.

Moderator:	Thank you very much, David and Rikin. I wanted to point out that David's HNI organization is also working to integrate their services with radio in Malawi and Mozambique and maybe elsewhere. That's a – radio is a longtime popular tool for ICT and ag. And of course, various radio services are moving into mobile services, and now they're integrating with IVR.

And the second point I wanted to make – or, reemphasize – was what David said, was that the first time I talked to David I knew his organization was very small – and it still is very small and lean. Every time I asked him a question, "Can your system do this or that?" or "How many people use it for this or that?" he always had an answer. And I said, "Well, wait a second, David. How in the world can you do all this?" And he said, "We use VOTO Mobile as our service provider." So, note that HNI is using VOTO Mobile, and they're extending the way they use it in each country with more capability. So, we could have a whole different discussion about how David uses VOTO Mobile and how easy it is, but we'll reserve that for some of our Q&A.

Now, we'll turn to Neil, who has a system somewhat like VOTO Mobile called Awaaz.De, and he'll explain how his service works.

Neil Patel:	Thanks, Judy. And hello, everyone. It's a pleasure to be with you all and great to see such a wonderful turnout for this webinar. I'm going to present about Awaaz.De, which has been working in IVR systems for the development sector for many years. We were one of the first organizations to get started in this space. And most of our work is based out of India, but increasingly working in other places around the world, particularly Africa.

So, in terms of who we are, we are an organization that started in 2011, and we were based off of a research project down outside of Stanford University and UC Berkeley led by myself and my cofounder, Tapan Parikh. And we were interested in trying to leverage IVR to, in the beginning, reach small-scale farmers in India. And our early research work led to developing a suite of different tools all based on IVR to communicate to the … in various ways. So, we focused on the development sector, and our expertise is in IVR, but we provided a variety of different mobile solutions. And we served millions of phone calls, reaching hundreds of thousands of people, mostly in India, but as mentioned, increasingly in places such as Africa and South America.

With respect to agriculture, we started our work in agriculture, as mentioned. Our first project was a question and answer service for smallholder farmers in Gujarat, India to be able to access – ask and answer agricultural-related questions. Since then, we've worked with a number of different organizations to provide various types of extension-based – IVR-based extension services, ranging from information dissemination, data collection, and also, as mentioned, peer-to-peer-based information sharing.

Here is a look at some of the organizations that we've worked with. For the purposes of this presentation and just given we don't have a lot of time, I'm going to focus on three different organizations or services that we've developed and have partnered with organizations who provide that give you – that will give you a sense for the types of ways we found IVR useful and effective in reaching and connecting smallholder farmers.

So, I'm going to start by talking about a discussion forum in Gujarat, move on to sort of a push method-based service – also in Gujarat – and then finally end with our – one of our most recent products, which is working with the Ministry of Agriculture in Ethiopia to deliver question and answer functionality at a country scale. And you'll notice here that the size of the project also increases, and we can discuss how the different types of surveys also affect the size and scale of the relationship between the two. But this would also give a sense for small to large types of applications that IVR can have in various contexts.

So, I'm going to start with Sajiv Kheti Samvaad."Sajiv kheti" is the Gujarati term for organic farming: It means "living agriculture," literally. And "samvaad" means "conversation" or "dialogue." So, this service is meant specifically for organic farmers in the state of

Gujarat – the system is completely in Gujarati – for basically accessing and sharing agricultural information related to organic farming. So, a farmer who is interested in organic farming may get to know that the number – this number is available. Just calls in; it's a local Gujarat … number, so it's like making a regular phone call, and accesses one of several menu options to get different types of information.

Because organic farming is still relatively new to many farmers, at least in this generation, we offer a way for a farmer to call in and just get basic information about organic farming – so, that's the general information section. They can then access announcements related to the organic farming movement in the state, and then also access a question and answer forum where they can ask questions and hear the responses of other farmers. And then, finally, a buyer and seller marketplace where farmers can either offer some organic produce that they are willing to sell, or buyers call in to request organic produce that they would like to buy, and it becomes a market whereby buyers and sellers can connect with each other. Sort of related – in fact, identical to the concept that David discussed in the last presentation.

So, this is a relatively small scale service. And I want to emphasize that it's small scale – it's a few hundred farmers and a few thousand messages. But it's suitable to the particular goals of this particular context, which is building a community of organic farmers. One of the most interesting aspects of Sajiv Kheti Samvaad is that the questions that farmers ask are responded directly by other farmers. There is no organization besides simple moderation and coordination that is involved in answering the questions of farmers. It is accomplished by senior organic farmers who respond to the questions of other farmers, which is really one of the more unique aspects of the system, and maybe in India and potentially in the world, it's where a pure farmer-to-farmer knowledge-sharing service. And this system was derived out of earlier work we did where we developed an organic certification system for farmers where, again, it was a peer-to-peer-driven certification model where more senior farmers were the essential – essentially inspected the … for the new farmers. So, in keeping with this concept of mentorship of more senior farmers helping others, this forum sort of reflects that in sort of a digital forum.

I will also draw a note to the buyer and seller marketplace to just give you a sense for how this works. A person navigates through one main menu navigational step into the buyer and seller forum. They're prompted to either record a message or listen to previously

recorded messages. If they record a message, then they're prompted after a beep to either share a message about what they want to buy or what they're willing to sell. And then, once the message gets captured by the system, a moderator decides whether it's a buying or a selling-related question – related message, and tags it accordingly. And then, when somebody goes down to listen to the buyer and seller forum, they can choose either to listen to buyer-related messages, seller-related messages, or all messages so that there's a little bit of a filtration. One of the limitations of IVR is that you only can listen to one message at a time, so you want to design your IVR system smartly so that you can get to the content you require as quickly as possible. So, you use some filtration. Of course, the tradeoff is there are more navigational steps to get to the content – so, it's a design tradeoff. So, this is an example of a true peer-to-peer, farmer-to-farmer information sharing system.

The next system I want to share about is called Khedut Saathi. "Khedut" means "farmer;" "saathi" means "friend." This is another agricultural-related system that Awaaz.De itself launched in Gujarat in 2013. The idea here was to focus on push-based content. So, whereas the Sajiv Kheti Samvaad was a farmer-to-farmer, a many-to-many connecting system, in the case of Khedut Saathi, it was a one-to-many system. We had a group of agricultural experts who would basically compose agricultural content based on the growing season and the types of crops that were popular in specific regions and create essentially audio podcasts two to three times a week, short episodes ranging from 60 seconds to 120 seconds – so, one to two minutes, not too long – which would kind of give you the content of the day.

And we actually took an additional step to add some production value to these messages – so, it wasn't just dry agricultural content, but we partnered with a local media house that focuses on rural content and added scripted dialogue, background music, made it an infotainment kind of service to hopefully increase the engagement of this system amongst the farmers. So, we were not just interested in, say, reaching a million farmers; we were interested in reaching a million farmers who would continue to call in or to pick up and hear these messages. We wanted to create a very sticky system. And so, for that, we thought of creating a more engaging content format. That ended up working very well, and many farmers subscribe to this system. But what we're most proud of is that very few opt out. And so, they continue to remain subscribed. And on top of that, for each message that we broadcast – again, a simple phone call going to a farmer's phone with the Khedut Saathi phone number in the caller ID, they recognize it and they pick up – and

they pick up continually, message after message. Up to 70% or more of the farmer that subscribe pick up. So, this is a really incredible example of a sticky service.

A couple other innovative things that we've done with this system. One is we started off leaving the content on Khedut Saathi with sort of expert-based content that we would kind of work – our agricultural team would develop and then send out, but we would also collect feedback from farmers. So, when a message went out, there would be a prompt for the farmer to record their feedback about the message. And we left it at that. We left it open-ended: It could be a follow-up question, it could be a suggestion for new content. It could be an open-ended experience. And in fact, that's what farmers ended up sharing: They ended up sharing a wide variety of different types of messages that (a) informed future content, but also, we found that many farmers were sharing in such a way that what they were – what their experiences were would be relevant to the rest of the farmers on the service. So, over time, we started taking some of the choice content that came as a response to our original content and basically retweeting it back out to the entire subscriber base in the exact voice of the farmer. We basically left the messages intact. And so, essentially, farmers began over time hearing more and more from themselves, from each other, in terms of the content that they were receiving.

When we did subsequent field research, we asked farmers about the content. Overwhelmingly, the farmers preferred hearing content from their peers. This is, of course, a result that Digital Green has shown in their own work, that farmers are very interested, very engaged when content is coming from other farmers. So, what was clear about Khedut Saathi is it became something that over time became more and more owned by the subscribers. The voice of Khedut Saathi became less and less us – the administrators of the system – and more and more the farmers themselves. And that ultimately is what continued to increase the engagement.

Along with that, "Forward to friend." We added a feature where farmers who were subscribed to the service could press 4 to forward the message on to up to five of their buddies. And they would do that by essentially keying in the 10-digit number of each of their friends, and the system would then queue up the message to go out to those additional people. So, in that way, we were interested in how the system would spread in a viral way, leveraging existing peer networks of farmers. And very interestingly, about a third of farmers ended up choosing to

forward a message on to a friend at some given time. This was actually way beyond what we expected but was, of course, in hindsight quite obvious that farmers inherently have peer networks and are anxious to share with others. And this is also a more organic way that we can share the user base.

Another final thing I will share about this system is the experiences from a sustainability standpoint, which David rightly pointed out is a very key component to any sort of extension service. We started experimenting with sending advertising content. We partnered with a local agricultural input company who wanted to reach directly to farmers. They were sending television and radio ads, but they saw the mobile-based system as an additional channel to very directly target in a targeted way these farmers, and through both SMS and voice ads was actually very successful in getting a number of leads. In one campaign, I think it was 30% of farmers reached responded with interest to an advertising feed that was offered, which was really unheard of for the advertiser. They were very pleased.

Finally, I'll end with sharing a little bit about our – one of our latest projects, and this is in collaboration with Digital Green, and it's a USAID-supported project that we're doing in Ethiopia. It's a consortium – along with Digital Green, there is Farm Radio International and also Dimagi. And we're experimenting with innovative usages of ICT for improving extension and benefitting farmers in Ethiopia. We're there to basically, as I described, leverage IVR in various ways. While working on our own project, our existing work, we were connected with the Agricultural Transformation Agency – the ATA – in Ethiopia, who was already running a national hotline for farmers. It was called 8028. Doing this – and it's a static IVR much in the line of the 3-2-1 system that David described, whereby farmers would navigate an IVR tree and get to agricultural content that was based on their choice of crop and of topic.

And also, a first-time caller, very interestingly, would have to go through a gamut of profile-related questions asking about things like the size of their farm, the crop that they grow. It would take roughly 15 minutes for a first-time caller to register themselves with this system, but the majority of callers end up registering in the system just to get to the content, which shows you the demand for the content. But in the process, we have very detailed profiles of about 1.2 million farmers in Ethiopia with very specific data about their profile. And along with – so, along with that, we can

now then turn around and send very targeted content, another thing David mentioned with regard to personalization.

So, anyway, we had this static line. And ATA was interested in Awaaz.De's work with more interactive features of IVR and wanted to work with us to implement a question and answer functionality on top of this static system that they already had. So, over the last few months of 2015, we collaborated with ATA along with local IT companies in Ethiopia to implement a question and answer service where farmers would call into the same number, but after listening to the static content, if they were still unable to get the information they required, could press an option to record a question. After the beep sounded, they would record their question and the system – much like with Sajiv Kheti Samvaad – would get captured and available through a web-based interface for a moderator to listen to the question, to tag the question, and very importantly, assign it to an expert who would be able to readily respond to the question and deliver, of course, a more personalized response.

We just launched the pilot for this system, so we only have early data. The goal is, if the pilot is successful, to make the service available across the entire state of Ethiopia, country of Ethiopia. Right now, we're piloting in 16 … . And the early results have been very impressive. Despite the fact that this is an off season for farmers, the interest and enthusiasm to record questions has been really, really impressive. So, we have about, I think even since this slide was developed, I think we have now crossed 3000 recordings to the system by farmers. And I want to mention – emphasize *recordings* because most of these recordings are faulty. So, the farmers are being exposed to this system for the very first time and many of them are not recording actual questions. They're recording a recording, but the questions are not necessarily coming in as legitimate. And so, many of them are being tagged in the system as "accidental entries," as I mentioned here.

It's an interesting development, and what we've instructed the moderators to do is to not ignore these accidental entry messages, whether they're noise or they're misrecorded or they're incomplete questions. Every single recording is going to get a response back from the system and uploaded by the moderator. So, the moderators have a preset set of canned responses. In the case of a misrecording or an inaudible recording, they record a response – they upload a response so that the farmer is informed, so that the next time they go to ask a question they would be able to be more prepared to ask – to record properly so that they can get their

question actually addressed. So, we – that's an example of how we boost up the learning of the system by – through the system itself. Question and answer is something that's unfamiliar to many of the farmers. It's going to take some time for them to uptake it. And it's potentially very daunting and expensive to go farmer to farmer and train them on how to use the system, so let's use the system itself to the best of our ability to inform the farmers.

Another way that we can do that is by offering FAQ. So, over time, if there are a set of questions that are common, that are well asked, then we can also make those available through the IVR system so that farmers can hear other farmers asking questions. That would give them a sense of what a question actually is, what's a legitimate way to ask a question, what other questions are farmers asking? This is an indirect way of learning for them to be able to ask questions that can be readily responded to. And along with that, we have some other projects planned with ATA including data collections and voice-based surveys.

I'll end there – or, end with a few key challenges, and we can probably get more into these in the discussions. But IVR, for all of its benefits, there are some challenges. One of the biggest challenges is the technical difficulty in setting up IVR. Different countries have different rules and regulations with respect to voice over IP and telephony. That has to be navigated. Telephony software itself is somewhat difficult to deal with. It's not like creating a web app or even a website. There is some specialized technology knowledge that is required to develop and administer IVR systems, so that's sometimes a barrier. When you have an IVR line, it's – getting the word out about it is oftentimes a challenge. In the case of HNI, when you're working with a big partner in telco like Airtel it's not so much of a challenge. But if you're a grassroots organization, how do you get the word out that this number exists? How do you encourage people to call in? And how do you train people? These are valid challenges of IVR.

Interactivity, for all of its benefits of interactivity, one of the key benefits is that farmers can actually record in their own voice, or any person can record in their voice, so that overcomes language and literacy barriers. But at the same time, navigating an IVR menu is sometimes cumbersome, especially if you have a lot of data. And finally, cost. This is the key thing. And as David mentioned, the traffic, the volume of these systems at scale can be very exorbitant, so we need a sustainability plan.

I'll end there. It's been a pleasure speaking with you all, and I look forward to the question and answer.

[End of Audio]

Moderator:	I have a couple of comments to make, and I'll start off the Q&A. But here you can see on a slide some top takeaways – although you probably have your own. Clearly, IVR is not the plain vanilla service that I had thought it was a few years ago when I started learning how IVR was being used. It does have great advantages to overcome challenges of illiteracy and language. And the third one is an interesting one I want to ask David about, given he uses VOTO mobile. So, you can take a look at these while I pose a question to David, then we'll turn to your questions.

But David, how did you end up choosing VOTO Mobile? And how is it – how easy is it to set up and use technically? |
| *David McAfee:* | Well, it's a great question, Judy. We actually went through a process of public tendering to try to find a service provider, and we were lucky enough to be referred to VOTO Mobile. So, it was through a process of sort of public identification that we chose them. And really, what they offer is in essence a hosted application, which means that our program managers in those 13 countries, they can go to a single website to be able to manage their content – so, to create their menus, to update their sound files. And once they do, 15 seconds later, the people in the country where 3-2-1 is launched, they can actually hear that message.

So, the telephone companies trust us enough that we can make the new weather forecast sound file, upload it to the VOTO Mobile site, and then the VOTO Mobile site pushes it to our infrastructure in the data center of the data com in the particular countries – so, for instance, in Malawi. So, it's sort of a one-stop shop that allows us to organize the content in a single hosted website – so, that's a big advantage.

In terms of the ease of use, we've been very, very pleased with the VOTO Mobile application because it allows you to create these decision trees, these menus, with sort of a drag-and-drop ease of functionality. But frankly, we really pushed them because their application wasn't designed, really, for the 3-2-1 use case. Their application was really designed to collect survey data. So, if you're Facebook and you have 10 or 15 questions or if you're Farm Radio and you have 10 or 15 questions, part of the advantage of VOTO Mobile is the ability to send out these automated surveys. So, your phone rings, you hear an introductory message, and then you can opt in to take the automatic survey. So, it was really designed as a |

data collection tool rather than a communication tool. So, we've had to really push VOTO Mobile to add features and functionality that could handle the decision trees that literally have something like 500 to 750 messages. But I'm happy to tell you that they've been a wonderful partner in adapting their technology even for our use case, even for one that pushes them as much as ours does.

Moderator: Thank you very much, David. I – this is Judy again – I have lots of questions from the audience, so it's – I'm trying to sort through ones that I see repeated. One has to do with quality control related to content, and that's from Sylvia Alonzo. And I think actually all three of you could probably address that. I did want to mention something that I've learned about the content process for Digital Green, and that is they do use peers in their low cost videos as well as probably their voices in radio. But that doesn't mean that they let the peers just say anything; they actually have a quality control process to make sure that those that are featured are actually saying the right thing, correct advice.

In the case of Awaaz.De, it sounded like you were literally just using peer-to-peer, unmediated content exchanges, and I wonder how you use quality control there. And David, I know you are involved in content processes in various countries. So, each of you, could you speak a bit about your quality control process on content?

Rikin Gandhi: Yeah, as Judy just mentioned, we follow a moderated approach to our user-generated content, both for video and also our work with IVR, including the work with Awaaz.De in Ethiopia, in that the content is sort of produced and moderated by these public extension systems that we have partnered with. But it is localized and socialized by these – by the local community, so that they take some of these kind of practices that have been vetted by, say, the research system and others, but then they share that information in the context of a local farmer sharing his or her background and her story about how they applied this or that practice and the value that they were able to realize.

And then, at different stages in the content production process there are the subject matter specialists of our partner organizations, typically, who help to kind of ensure that the integrity of the message is maintained before it is broadcast out to more – to larger audiences. And even when it comes to the data and feedback that is captured from these communities, it's also not just rebroadcast straightaway; there is a curation process by – again, by these same subject matter specialists, or sometimes even lead farmer types of

	people, who help moderate which of this should feed into being shared more broadly and inform sort of extension contents more generally.
Moderator:	Thanks, Rikin. Neil, do you want to comment, especially on that peer-to-peer part of your service?
Neil Patel:	Yeah, sure, Judy. So, I will clarify that even in that system where farmers were responding to each other's questions there was still a moderation step in the process. So, really, in fact, Awaaz.De doesn't have really have – do anything in terms of the peer-to-peer system – literally, any sort of dissemination system – without some sort of moderation step because the quality of the content is of utmost concern.
	In the case of that peer-to-peer system, the huge point here is that on the other side of the response are other farmers, but that being said, there still is an organization that is making sure that the responses are of quality, are accurate. And also, there is – a moderator who replies can do administrative things. Like, if a farmer – if a responder is not responding, to make sure that they follow up with that person so that a question is responded to in a timely way. So, in any case, a moderator is required. In that case, it is as well.
Moderator:	Good. Thank you for that clarification. And David, can you speak a bit on your content management process? I know you are – you've got one where the government is involved to Malawi, and perhaps elsewhere. And you have to do content across sectors.
David McAfee:	Yeah. Yeah, that's exactly right. And so, we at HNI, we don't write any of the content. I like to say that the only thing I know about agriculture in Malawi is that I like to eat the food. But at the end of the day, all of the content has to be created locally by a committee of experts: It's called the National Agricultural Content Development Committee, and this local committee has recognized experts and it's chaired by the government extension agent. So, nothing is published on 3-2-1 until it's been developed locally by the local experts and it's been approved by the government.
	Now, this process has its advantages and disadvantages. We feel strongly that there is some basic information that every farmer needs on-demand and free access to. So, think the weather forecast and crop pricing and basic advice about the different strategies as the farmer goes through the agricultural calendar. We feel like that information needs to be available. But to produce that information,

you really have to have sort of a Goldilocks strategy. If your committee's too big, it takes too long to create the content by consensus. If it's too small, then there's not enough ownership. Because what we find is that the content creation process, it's a little bit like sausage making: You really don't want to watch the process but you want to eat the sausage at the end. So, the idea is to have a committee that is focused on creating this content and does so on a regular, ongoing basis.

And so far, we've had some pretty good success at this. I've been frustrated a little bit with the time that it takes for the content committees to produce this information, but the good news is that the basics now are up there for a pretty wide variety of crops. And now, what I'd like to do is move towards making the service a little bit more focused on user-generated content, especially – especially bringing buyers and sellers together and allowing farmers to ask some questions that aren't yet covered by sort of the static information available on 3-2-1.

But Judy, you're right: We do this process over and over and over again across the different sectors, but also in different countries, so we've gotten pretty good at it at this point. And we sort of think of ourselves as air traffic controllers, and the people who are creating the content, they're the pilots. So, we give them some parameters in terms of the length of the messages, in terms of some ideas about how the structure has been created in other places, but really, they're flying the airplanes.

Moderator: Thanks, David. Actually, I was involved in an earlier effort with four different mobile network operators in Africa; it was managed by GSMA and funded by the Gates Foundation and USAID. And the area of content management was *extremely* painful and getting the MNOs, who are arch competitors, together to talk about their content process was almost too much to listen to. So, I'm glad we've advanced much beyond that and much through the help of HNI and its efforts as well as GSMA. They learned a lot and then brought in Kavi, actually, to provide a framework for content development across countries.

I have another question about content, and then I'll have one more before we're going to have to sign off, and that is integrating content across digital channels. We know that we have face-to-face extension services. We also have radio, low cost video, text messages, voice. All of these require different sizes of messages and also are better for different kinds of communications. You're not going to teach somebody how to graft a tree over text – over

IVR, but you may want to give them an alert that makes more sense over IVR rather than over, say, low cost video.

So, can any of you – would you like to jump in and talk? I know you're all working on that because I know in the countries you're working you are rolling out other content channels.

Rikin Gandhi: Yeah, I can jump first. So, yeah, no, I think here at Digital Green what we found sort of success in is by starting with these local farmer organizations, whether they be women self-help groups, farmer cooperatives, or other types of institutions at the community level, and then partnering very closely with those extension systems – the private and public and civil society types – that are involved in and already engaging these farming communities as sort of the foundation before any digital sort of layer is introduced, whether that be low-cost video or IVR. And the reason for that is that information in and of itself has some value, but it's much greater when that information is tied together with products and services across the value chain in the real world, on the ground. And that's what existing on-the-ground extension systems have as their bread and butter mandate. And that's what we've found sort of success in.

And then, with regard to these different sorts of ITP channels, the sort of theory of change hypothesis that we're actually trying to test and evaluate in Ethiopia with this combination of radio in collaboration with Farm Radio International, video with our work, as well as Awaaz.De's work with interactive voice response, and mobile applications with Dimagi, is to test this hypothesis that perhaps broadcast channels of media are good for kind of general campaign awareness. And I would say IVR can do that and also, of course, radio has a longstanding sort of ability to do that at a large scale.

Mediated low cost video that is mediated by these local extension groups amongst farmer groups tends to be more persuasive and obviously a much more richer form of communicating agronomic sorts of practices. And then, IVR again can have a role subsequently to help reinforce sort of the messages that folks are being exposed to and be able to provide a mechanism for a question and answer.

And of course, each of these modes of communication have different bits with regard to cost and effectiveness, right? So, video is a rich form of communication, but it is more intensive with regard to kind of like production and distribution – but it can be

very supportive at the local level. Whereas, radio and mobile, IVR, can be much more dynamic with regards to being able to change over content much more rapidly and be able to share information that does change rapidly, whether that is weather or markets types of information, but maybe doesn't communicate – or has challenges when it's got a more richer form of communication.

Moderator:

I want to thank the – all the listeners who have posed so many good questions, and I have a bunch I want to still answer. We're not going to be able to get those, but you can either post them via Agrilinks or you can send them to me at judy – or, jpayne@usaid.gov. And if I don't answer you, send it again. And make sure your subject line is really clear.

So, our last question has to do with gender: Donors, governments, others care about reaching female partners – how do you track that? I know that I've had some discussions with each of you about that, but how are you doing that today? Or, what are you going to do to change that?

David McAfee:

This is an incredibly important to us because the reality is in most of the countries where we work not even the telephone companies know the profile of the person who is using their telephone lines. So, in some countries, when you register, when you purchase a new SIM card, you have to give biometric information. But certainly, in a lot of countries in Africa no information is collected at all. So, not even the telephone companies in most countries can tell you if the person who is using the line, if it's a man or a woman. So, as part of the 3-2-1 Service, at the end of every key message we ask the caller if they'd like more information on this particular subject to press 1. And when they do, we say, "Great. In order to get you the right information, tell us a little bit about yourself." And then, we ask three profile questions: sex, age and location. And we use the demographic and health survey standard scale in order to get that information. So, for instance, by *tranche* of age or by region or district, depending on what the DHS does. Because really, what we're trying to do is develop a database of frequent 3-2-1 users and then be able to say something about the profiles of the people who – the – is using the 3-2-1 Service.

So, we were just starting this back in March in Malawi. And on my – on the PowerPoint presentation, you can see the number of people who have already registered. There's something like 20,000 people in Malawi who have provided this information. So, this is incredibly important to us because we need to be able to say, "Here is the average profile. Here's what a profile of an average 3-2-1

user looks like. Here's where they're from. Here's their age. Here's the sex breakdown."

It also gives us a great opportunity, then, to also send survey questions back out to people in a very targeted fashion. So if we, for instance, have a partner who would like to have survey information about women who live in the north of Malawi at this particular age *tranche*, we can actually work with VOTO Mobile to execute that automated survey in short order. We just did this with Chemonics last week, and it took us about a day and a half to get over 200 responses to a 19-question questionnaire.

So, the idea of profiling our 3-2-1 users is incredibly important. There are of course issues of confidentiality and anonymity, so all of the processes that we just mentioned, they're purely voluntary and people opt into them in exchange for, for instance, information that is then pushed to them.

Neil Patel: Yeah, Judy, I can say one thing, which is we have also adopted the same approach as David mentioned, with respect to asking a multiple choice or voice survey question about gender. The other thing that we're exploring – in fact, we were just meeting with a group from ISMR in India to explore the possibility of using voice biometrics. So, there are some technology companies here in India that have developed an interesting technology to identify different things from voice that's simply recorded over a phone call. So, you can imagine a way to at least do gender recognition by the sound of a person's voice, and it's something that we're actively looking into.

Moderator: I want to thank our presenters. They did an excellent job. I learned a lot and want to learn a lot more. And I want to thank our participants as well.

USAID Agrilinks: So, that wraps up this webinar and IVR's role in ag extension. I'd like to again extend a big thank you to our moderator, Judy, and to our three speakers, Rikin, Neil, and David. And thanks again to all of you for taking the time to tune into this really exciting event, and we hope you found it just as informative as we did.

And lastly, I'd like to encourage you all to visit Agrilinks to continue this discussion. As Judy mentioned, you can post any follow-up questions on the event page itself in the comments section. And as always, you can submit resources or blog posts to Agrilinks. And feel free to send an e-mail to

agrilinks@agrilinks.org or to me personally at djames@kdad.org if you have any other points for consideration.

Thank you all once again, and please enjoy the rest of your day.

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