

Ramona Schindelheim, WorkingNation editor-in-chief:

You are listening to Work in Progress. I'm Ramona Schindelheim, editor-in-chief of WorkingNation. Work in Progress explores the rapidly changing workplace through conversations with innovators, educators and decision-makers, people with solutions to today's workforce challenges. There are about 48 million people living in rural communities in the US, that's more than 14% of the total population in the country. They need access to technology, especially high-speed internet for the best career opportunities, and they also need access to capital to grow entrepreneurship and create new tech jobs. One organization helping close the tech opportunity gap in rural America is the Center on Rural Innovation. Earlier this month at the annual giant tech show CES in Las Vegas I spoke with Matt Dunne, founder and executive director of the center. He started by telling me what they've been working on.

Matt Dunne, Center on Rural Innovation founder and executive director:

We're working with communities across the country. We focus on micropolitan areas, which are those places that are bigger than a bread box of a real downtown, but are truly rural in nature. And we help them to be able to both get those kinds of technology jobs that pay good wages and are more future-proof, but also to be able to start innovation-based companies so they can grow wealth in their community that they love.

Ramona Schindelheim, WorkingNation editor-in-chief:

And how are you doing that? Are you connecting them with the money itself? Are you connecting them with ideas? How are you making it happen?

Matt Dunne, Center on Rural Innovation founder and executive director:

Yeah. The biggest challenge for rural founders and aspiring rural technologists is isolation. It's really nothing else. It's not their capacity, their tenacity, or even their innovative ideas, it's being able to connect them to the advisors that can give them the information that they need to be able to be successful, as you might find in a Palo Alto or a Cambridge, Massachusetts or someplace like that. And then also the capital so that they can either get the training that they need to be on the forefront of technology, whether they're working remotely or for the local hospital, or in starting their own innovation-based company, because venture capital is hard to come by when you don't already have an ecosystem that can support those kinds of innovation-based ideas and bringing them to market.

So we've been working with communities now for almost eight years, helping them to create both the strategy to leverage the assets they have, but also to secure the funding, usually through Federal Economic Development Administration dollars to be able to stand up tech talent development programs, tech accelerators, and then the place and spaces to create density and bring people together as a tech community.

Ramona Schindelheim, WorkingNation editor-in-chief:

Can you give me an example of one of these communities and how what you have done and making that connection has made a difference for people?

Matt Dunne, Center on Rural Innovation founder and executive director:

Sure. I'll take Portsmouth, Ohio. It's in this very southern part of Ohio in Appalachia. They have struggled for really the last 40 years, and most recently at being the center of the opioid epidemic, but incredible leadership that's there helped bring world-class broadband and then allowed for a university like

Shawnee State to really zero in on game development and game development entrepreneurship as a core area. They went ahead and built an innovation center right on the border of the downtown and the university to pull in both sides of that community to be able to work together.

They then were able to receive not only funding to help with tech talent development, particularly from folks who had been in a non-traditional education pathway, but also to start an accelerator program itself that's now attracting folks to come down from Columbus to get their ideas to market. And we're seeing that then have lots of other ripple effects. Folks who are coming home who grew up there have been successful in Silicon Valley and are now bringing their companies and their capacity back to Portsmouth. And most recently they were awarded a \$35 million riverfront redevelopment grant, which is going to allow them to transform their place that's building on the momentum that's coming with their innovation investments. That's an example right in the heart of middle America.

Ramona Schindelheim, WorkingNation editor-in-chief:

And once you do that and maybe bring these entrepreneurs in and their ideas and their home base, they're homegrown there, how are you making sure you have a workforce for those folks?

Matt Dunne, Center on Rural Innovation founder and executive director:

So you got to do the two things at the same time. You just do the workforce side, people move, and if you just do the entrepreneurship side, they don't have the talent to be able to build from there. So we really work with communities on those parallel tracks so that they can have the talent pool pipeline, again, from folks who are coming out of a university system, or people who've had a non-traditional pathway to education and are looking for a career change. And we've seen with lots of efforts in cities where you can do that reskilling into technology jobs like cybersecurity, IT specialists, full-stack developers, and be able to then bring that same kind of approach to these smaller markets. So we have a whole team that does that, works with employers as well as education institutions like community colleges that may not have that expertise themselves, but are then able to partner with online programming so they can bring all those pieces together.

Ramona Schindelheim, WorkingNation editor-in-chief:

And a key to a lot of this too is broadband.

Matt Dunne, Center on Rural Innovation founder and executive director:

Absolutely.

Ramona Schindelheim, WorkingNation editor-in-chief:

And if you don't have broadband, you cannot apply for a lot of jobs, you cannot get some of that training. So how are you working to bring broadband to those communities?

Matt Dunne, Center on Rural Innovation founder and executive director:

Well, I mean that's the table stakes, if you're going to make the case that you can have technology jobs or even a strong remote workforce with those higher quality earning potential, you've got to have the connectivity. The good news is that the last administration and the bipartisan infrastructure bill brought enough money that we can bring high-speed internet to every American. The trick is now implementing that. So we have a whole team that works with communities that are looking to leverage the bead funding and other kinds of resources to make sure that they're getting future-proof fiber to the home

connectivity and that it's affordable to make sure that everyone has the potential to access and leverage that platform for success, whether it's on their career trajectory or starting a company that can transform a marketplace. Yeah.

Ramona Schindelheim, WorkingNation editor-in-chief:

And 48 million Americans are in rural communities. About 10 million of those are people of color, and I think a lot of people have the idea that it's only white Americans who live there. Is there another challenge, an extra challenge for those people of color getting connected to that funding?

Matt Dunne, Center on Rural Innovation founder and executive director:

Sure. I mean, look, there are lots of misconceptions about rural America. One of the biggest ones that we are fighting is to make sure people know that rural America is not white America, that it's incredibly diverse. And if we're leaving out those individuals of color who are in rural America as we're trying to create greater equity, we're making a big mistake and we'll just never get there. So we really zero in on making sure that we're inclusive in the outreach that we do, as well as going to places that have higher diverse rural populations. In the Southeast, working in places like Wilson, North Carolina or Pine Bluff, Arkansas, but also in the Southwest where there are emerging Hispanic majorities. And we've started to collaborate with tribal communities as well, with the Cherokee Nation in Oklahoma as well as tribal communities in Michigan.

So we think that there is a real opportunity to do that outreach. The barriers are multitude. I mean, you start with people somehow believing if you live in a rural place, you can't code, which isn't the case. But there became this view that you had to live in a city if you were going to work in tech. And then all the inherent biases about individuals of color being able to participate in those economies, which also are not true, but you need to be proactive in making sure that folks both are doing that outreach, but also folks in that community understand that these are jobs for them and that this can be something that is a career path, because unfortunately, when you have issues of systemic racism and other things, you start to internalize it and feel like that's maybe not my pathway. We make proactive efforts and we work with our communities to learn best practices for doing that outreach and making sure that we have examples and models of folks who have succeeded from those communities.

Ramona Schindelheim, WorkingNation editor-in-chief:

A lot of employers are saying they can't find skilled workforce. Looking in a rural community is probably a good idea. What's at stake if you don't bring in that rural community into our economy?

Matt Dunne, Center on Rural Innovation founder and executive director:

Well, I mean there's a few things at stake. One is you're missing out on a whole bunch of really amazing perspectives because if you live in a rural place, I would argue there's a certain grit that you have because you're having to wear all the hats and figure out things on a regular basis. And that's just a unique perspective that you could bring to your company and to taking on the challenges that you have as you're trying to build an organization or a company using technology.

But the bigger risk as a nation is that we become more divided, and we have seen since the Great Recession, an unbelievable division emerge economically between rural and urban places, one that was unprecedented, and it was all about the winners and losers of the tech economy. And that then starts to tug at the fabric of our nation in all kinds of ways. So I believe it's an imperative, both in our national competitiveness to be able to make sure that we're bringing all voices and minds to the table,

particularly folks in rural communities. But it's also important for our nation to be able to come back together and be the nation that we all hope it will be.

Ramona Schindelheim, WorkingNation editor-in-chief:

When you think about rural America, farming probably comes to mind. Farms are a big part of the rural US, and even there technology is changing the way people work. While I was at CES, I stopped by the John Deere booth and spoke with Jeff Runde. He's the company's engineering director, and he explained how ag tech is changing the way our crops are farmed, specifically how modern equipment has been reducing a lot of manual labor. Runde started by showing me the autonomous driverless applications on its newest, largest tractor.

Jeff Runde, John Deere engineering manager:

This is a 9RX 830, it happens to be the largest production tractor on the planet right now.

Ramona Schindelheim, WorkingNation editor-in-chief:

It's pretty huge.

Jeff Runde, John Deere engineering manager:

It's pretty big.

Ramona Schindelheim, WorkingNation editor-in-chief:

I don't think I've seen anything this massive before.

Jeff Runde, John Deere engineering manager:

Yep. It's a little bit bigger than the tractors we've had at CES in the past years, but we wanted to bring the biggest one this year.

Ramona Schindelheim, WorkingNation editor-in-chief:

And so as an engineer, what have you done to make this so user-friendly and just what we need in the field today?

Jeff Runde, John Deere engineering manager:

Yeah, so we do quite a bit of work with our farm customers. So we're always out in the field interviewing different users of the tractor, understanding their use cases, the different practices and different jobs that they need to do. So we take that feedback that really impacts how we do our user experience, often the displays in the cab, it impacts our web tool, what you can do there, and our mobile phone app and really everything,

Ramona Schindelheim, WorkingNation editor-in-chief:

The skills that you need as an engineer, do those change at all or, I mean, are you learning something new and putting something new into this, or are you just making applications from what you already know?

Jeff Runde, John Deere engineering manager:

My background is software engineering by trade, but the job really working for John Deere, especially on these projects, really requires knowledge in the domain space. So a little bit of an understanding on agriculture, how to talk to farmers, we're always out in the field, and then already bringing in a diverse group of engineers that have background in different technologies.

Ramona Schindelheim, WorkingNation editor-in-chief:

And for the person who might be using this in the field, do they have to know anything special to be able to operate it?

Jeff Runde, John Deere engineering manager:

No, we intentionally design our systems for every farm customer that we have. This tractor, you'll find it in the US and Canada market, but we would also export it around the world and in places where there's large acres for it to work on. And those are different customers, but we do work with all of them and understand what their capabilities are. And they really tell us what they need too, so we take that feedback and design the tractors and implements and all the tools that they need to get their job done.

Ramona Schindelheim, WorkingNation editor-in-chief:

And I know that this has been going on a while, this is not your first rodeo with these here that using technology in the field, it's been around a while, but I'm always fascinated on the repair part of it. So can a guy who has a tractor at home, can he fix it himself or does he has to get somebody special in to do it?

Jeff Runde, John Deere engineering manager:

Yep, you can pull the tools out if you want to dive into that type of repair, you can pull the tools out, take whatever you need apart on this tractor. For example, you can take the transmission out of this tractor in about four hours if you have all the tools and things to do that.

Ramona Schindelheim, WorkingNation editor-in-chief:

I often wonder too, is it creating a whole new job for someone out there too? Is there a tractor repair place that people can take it to if they don't want to do it themselves?

Jeff Runde, John Deere engineering manager:

Yeah, generally, so if you're one of our farm customers, you're generally working with your local dealer. A big part of John Deere is the support that our dealers give to our customers. They're really the first line of defense, the first connection for a lot of these guys. Just like if you're buying a car and you have a question about that or repair a dealer is a good place to stop there.

Ramona Schindelheim, WorkingNation editor-in-chief:

And what can this vehicle do that the one before it couldn't do?

Jeff Runde, John Deere engineering manager:

So what we're showing here is our Rev 2 autonomy system. A few years ago we released at CES the Rev 1 system, so that was the original. The technology advances so fast that we were able to increase the capabilities of the machine. It can see farther, it can see wider, it allows us to go a little bit faster, opens up a lot more jobs for the customer to essentially run autonomy on.

Ramona Schindelheim, WorkingNation editor-in-chief:

So you're telling me nobody has to be in that vehicle to run it?

Jeff Runde, John Deere engineering manager:

Correct. So John Deere, we've been building tractors a lot smaller than this, we built up to this for the last hundred years with the manufacturing tractors, for the last 20 years you as a customer could buy a hands-free guidance systems. The vast majority of big acre farming in the United States these days is actually planted by a computer, the computer's steering the tractor most of the time in the field. It's almost a component or a system in the vehicle that our farmers, it's almost a requirement, like the heater needs to work, the hands-free guidance system needs to work to get the job done today.

Ramona Schindelheim, WorkingNation editor-in-chief:

Do you need an internet connectivity? Because one of the things in rural America is the internet and the unreliability of it. Do you need an internet connection to make this work?

Jeff Runde, John Deere engineering manager:

Every one of our vehicles here on the show floor and the vast majority of the vehicles that we produce have a telematics modem installed in them that lets the machine connect back and send and receive data essentially from our operations center, which is our web cloud-based tool that you as a customer can log into and you can see the agronomic data. If you're a customer saying you had your harvester, your combine running, then you can go back and look at the yield data, for example, the combine recorded for you. There's other data, like machine data that goes back and forth that essentially augments the ownership experience of the machine.

Ramona Schindelheim, WorkingNation editor-in-chief:

You're able to set up your plan before you go to farm, also you're getting feedback on what's happening with your crops as well, right?

Jeff Runde, John Deere engineering manager:

Correct. So in the downtime, we see a lot of our customers will plan for what the next year is going to be, like this field we're going to plant this specific crop, this other field, different crop kind of thing, and create all of those, what we call work plans, that lets you download all of those plans to the machine. You can forward those to the machine so when you show up in the field and it's go time, like the spring, you really need to get all of your corn planted in a tight window because that maximizes the ability for that corn to grow and produce the biggest crop for you. So at that point, you really want to go, so you get all the plans essentially from our cloud system down on the tractor so when you pull into the field, the whole machine is ready to go.

Ramona Schindelheim, WorkingNation editor-in-chief:

It's like one-stop shopping.

Jeff Runde, John Deere engineering manager:

We tried to do that, yes. So essentially make it easy to get up and get the job done that day.

Ramona Schindelheim, WorkingNation editor-in-chief:

Work in Progress Episode 349: Matt Dunne and Jeff Runde

That was Jeff Runde, engineering director at John Deere, and Matt Dunne, founder and executive director of the Center on Rural Innovation. I spoke with both of them at CES in Las Vegas. In the next episode of Work in Progress, I'll share another interview I did at CES. This one with Barbara Humpton, CEO of Siemens USA. We talk about AI-generated smart cities, a partnership that is making clean water more accessible, and a new aircraft Siemens has helped engineer and design and will help manufacture with aviation startup JetZero. I'm Ramona Schindelheim, editor-in-chief of WorkingNation. Thanks for listening.