THE BROOKINGS INSTITUTION

PUBLIC ATTITUDES ON U.S. MANUFACTURING

EIGHTH ANNUAL JOHN HAZEN WHITE FORUM ON PUBLIC POLICY

Washington, D.C.

Wednesday, July 17, 2019

**Panel 1:**

DARRELL M. WEST, Moderator
Vice President and Director, Governance Studies
The Brookings Institution

REPRESENTATIVE DAVID CICILLINE (D-RI)
U.S. House of Representatives

MOLLY KINDER
Senior Advisor, Work, Workers and Technology
New America

JOHN HAZEN WHITE, JR.
President and Chief Executive Officer
Taco, Inc.

**Panel 2:**

DARRELL M. WEST, Moderator
Vice President and Director, Governance Studies
The Brookings Institution

BUCKLEY BRINKMAN
Executive Director and Chief Executive Officer
Wisconsin Center for Manufacturing and Productivity

DAVID BROUSELL
Vice President and Executive Director,
Manufacturing Leadership Council
The National Association of Manufacturers

CHERYL MERCHANT
President
Taco Family of Companies

* * * * *

P R O C E E D I N G S

MR. WEST: Good afternoon. I'm Darrell West, vice president of Governance Studies at The Brookings Institution, and I would like to welcome you to the Eighth Annual John Hazen White Manufacturing Forum. And we are webcasting this event live, so a warm welcome to our viewers from across the country.

And we have a Twitter feed set up at #usmfg. That's U-S-M-F-G. So if you'd like to post any comments during the forum, feel free to do so.

This forum is supported by John Hazen White. John and his wife Liz and sons John and Ben and their wives are here. So I want to thank each of them for the financial support that has been provided. This enables the independent work that our scholars do and we are very grateful for the help that you have provided.

Last week, we released the results of a national survey examining public attitudes toward U.S. manufacturing. We asked a number of questions regarding people's feelings about manufacturing, their concerns about the future barriers to success, whether young people should go into the field, the impact of automation, and views about President Trump's 25 percent trade tariffs. And we'll be discussing those topics today and considering ways to move forward into the future.

We have put together a distinguished set of experts to help us think about manufacturing. To my left is David Cicilline, who is a congressman from Rhode Island. He was elected in 2010 and he already has risen to a leadership position within the House. He serves as chair of the Democratic Policy and Communications Committee. If you turn on the television you will see him it seems like every day now. I seem he regularly.

CONGRESSMAN CICILLINE: Probably not tonight.

MR. WEST: Maybe every other day. He also chairs the House Antitrust Subcommittee, which head a major hearing yesterday on the tech sector. So it's been a very busy week for you. And then from a manufacturing standpoint, he has been a leading advocate for the Make It In America agenda, which hopes to strengthen U.S. manufacturing.

To my right is Molly Kinder, who is the senior advisor for the National Network of Work, Workers, and Technology at the New America Foundation. She has undertaken insightful work on how technology is affecting the workforce in local communities across the country and what we can do to help workers deal with the transition that is coming. Molly also will be joining The Brookings Institution in October as a David Rubenstein fellow, so we look forward to welcoming you to our scholar list then.

And to my other right is John Hazen White, who is the CEO of Taco Comfort Solutions, which is based in Cranston, Rhode Island. He has been in the forefront of worker retraining and helping his employees gain new skills. And he also serves as a Brookings trustee.

So I want to start by reviewing a couple of key findings from our national survey, which polled over 2,000 adult Internet users between June 16 and June 18. And we asked about the current situation in regard to manufacturing and what people should think about the future.

And what we found is a good news/bad news situation. The good news is that 58 percent of Americans see manufacturing as vital to the U.S. economy, which, of course, it is because that sector employs over 11 million workers and generates over 5 trillion in economic activity each year. But the bad news is only 17 percent are very confident in the future of manufacturing. And people cited a number of barriers in terms of government regulations, poorly trained workers, high taxes, and high energy costs.

So I'm going to start with Congressman Cicilline and just ask how worried are you about the future of manufacturing? And what do we need to do in order to have a robust manufacturing sector?

CONGRESSMAN CICILLINE: Well, thank you again for including me on the panel. It's great to be with the White family at Brookings.

I'm very optimistic about the future of manufacturing in this country. I was very pleased to see in that report that the public perception on the importance of

manufacturing was very high. That has not always been the case, so I think that's very good news.

And I think, you know, one of the reasons that you see lower numbers about kind of the future of manufacturing is because I think there's a lot of anxiety about automation and about technology and about workforce capabilities. So I think one of the most important things we can do is still relentlessly focused on workforce training. And this is something that Taco does extraordinarily well, but understanding that as manufacturing becomes more sophisticated, more high-tech involving a high level of skill, that we need to train and prepare our workforce for that kind of advanced manufacturing. And I think that's an area where we have a lot of work to do.

I think focusing on apprenticeship opportunities so that people who are interested in transitioning into manufacturing have an opportunity to do that. Support the Maker Movement, which is kind of a great movement by young people particularly about making things again. I think strengthening our Buy America provisions and modernizing them so that we really use the purchasing power of the United States to support American manufacturing. And I think also continuing to create the Make It In America manufacturing communities that really encourage partnerships between the public sector, the private sector, the foundation world, higher education to help build manufacturing ecosystems and doing that in a very intentional way. Those are some ways that we can support the growth of manufacturing in our country.

MR. WEST: Okay, terrific. So, Molly, I know you've done consider work on automation and technology. In our survey we asked about automation and 64 percent said that they expect a lot of automation in manufacturing 10 years from now. So how do you think automation is going to affect the workforce? And based on the work you've been doing at New America, what should we be doing?

MS. KINDER: Darrell, it's a great question. I read the survey with great interest. There's two projects I'm working on that really resonate with this work that Darrell

has been leading.

The first is that in my role at New America we've been going into communities across the country and bringing together stakeholders to talk about how work is changing, how is automation going to impact jobs in those communities, and what to do about it. One of the communities that we spent time in is the Elkhart and Goshen region of Indiana, which, as we know, is a very heavy manufacturing region. It's the sort of home of RV production. And spending some time there it's very clear the importance of manufacturing jobs in people's lives.

This is very much related to this work I'm leading on interviewing the workers themselves who are in the jobs that stand to change the most. So I've just come back from several weeks in the field interviewing fast food workers, cashiers, retail salespeople, clerical workers to understand better how their job fits into their life, how they see it changing, what the future looks like, and what needs to be done.

We didn't interview manufacturing workers. However, this survey fills in some of those pieces and it resonates with a lot of the things we're finding. I was really struck by the survey responses, not just the 64 percent anticipating a lot of automation, but if you add in the people saying that there will be some automation, it was something like 75 percent of all the respondents. That's fact-based. That's actually factual.

And I think everyone on these panels is going to agree automation is here. It's already been happening in the manufacturing sector. And it's going to continue in some of the same ways and also in some different ways.

There's been a lot of reports talking about the future of work, predicting change in different sectors. Manufacturing and production is toward the top in almost all studies looking at how work is going to change over the next 20 years. Robots are getting better, cheaper, faster, multipurpose. There's a lot of different ways that production can be automated, and it certainly will impact the manufacturing workforce.

And one of the ways that really matters to me and my work is how is it going

to impact the workers who have enjoyed and report feeling very satisfied by work that provides a stable middle class lifestyle, but doesn't require a college degree? And we've seen over the last several decades that that middle of the wage spectrum, the good stable jobs that can provide for a family that don't require a college degree, manufacturing is one of them.

This is something that stands to be at risk. So the jobs that are at most risk in manufacturing are the ones that have the least education requirements and the least skilled. So that leaves a very big question.

So manufacturing has provided a middle class and stable opportunity for a lot of workers in a lot of communities. It's one that is valued by the workforce themselves. And as technology changes the factory floor and creates excellent new jobs that entail the technology itself, the skill level is going to move up in the factories, the need for skilled workers raises, and the need for lower-skilled workers on the assembly line diminishes. And that leaves just a very big challenge.

What can be done to make sure those workers can adapt to the way the factory is changing and the way manufacturing is changing? How can they be connected to the training that's going to help them move up that skill spectrum so they can connect to the excellent jobs that manufacturing will continue to generate?

It's a big challenge and I think it's one -- in our conversations when we go into communities, it's never one area that needs to respond. It's not just the manufacturing sector that has to handle this. There's a role for the education sector, the public sector, the social sector. There really has to be a lot coming together.

And I think one of the challenges is being able to look pretty clear-eyed into the future and see these changes coming. So I did find it quite striking that so many people responded that they did anticipate change was coming.

I saw that in addition to that most people still recommended manufacturing as a job for the future, so I think that provides some optimism. But as the jobs themselves

change, it's going to require really a multisectoral effort to make sure that the workforce that has benefited historically can continue to do so.

MR. WEST: So, Johnny, you are on the frontlines of manufacturing. And one of the interesting results in our survey was that 47 percent said they would encourage young people to go into manufacturing, 20 percent would not, and 35 percent were unsure. Now, in your family, you have two sons who have gone into the family business of manufacturing. Is there a future for young people in manufacturing?

MR. WHITE: Oh, I think a very exciting one. Manufacturing is transforming. To all of your points and, David, yours, manufacturing is transforming, you know, from I think what was probably viewed as old, dark, dirty, in a place where certainly, you know, the parents of my generation, meaning my parents' generation, were advocates for all of us to do better than they did. And so there was pretty much an insistence on going to college and furthering your education to do better. But this is now becoming a part of what's happening in manufacturing.

And I think, you know, this whole notion, it's very interesting to me because I've been talking about this in these forums for the last five years, I think, or three years, which is that I'm not certain that everybody needs to go to college. And I tell this story every year, I think.

There's a company in Wisconsin, someplace I believe, the factory dominates the town, thousands of jobs. And with the baby boomer exodus, which is real, we're feeling this now with some intensity actually, the baby boomer exodus is causing us to have to dig a little deeper for replacements. And a company like Taco, we have a half a percent turnover for the last 30 years, so finding new people is not something we've been doing regularly, so it's a challenge.

But in this company in Wisconsin, as they were losing people they decided they couldn't fill these jobs. And so they were just going to shut the factory and move to Mexico.

The town and the company got together and figured out that the problem was the parents weren't allowing the kids in the high school to desire to become employed here. So they brought the kids in. They began to bus the kids in from the high school and the kids saw what's real, which is all you're talking about: automation, robotics, you know, process improvement. It's fun stuff, I'm telling you. This is really exciting stuff. And the kids went home and said to the parents I want to go there.

So the next step was to bring the kids and the parents in to tour and see the place. And then, and this is brilliant -- I want to emulate this at Taco so badly; this is something that I'm working on with our training people now -- not only did they bring these kids after high school at, you know, 60- or $70,000, right, but they educated them. They provided the education. And we do that, right, so this is all a doable thing.

So I think there is a future of manufacturing and I think it's an exciting one and I think it will hold true to what we all know, which is that studies will show, I guess, that manufacturing is the greatest creator wealth. So we have a great -- and this country has the greatest minds for development, for R&D, for everything we do.

And look around the rest of the world. Look at Germany, look at Japan, look at these countries that have really prospered in the area of manufacturing. They've done it by improving.

So the possibilities for us are absolutely real. I feel very strongly about that or I don't think I'd stay in because I don't like boring. (Laughter)

MR. WEST: Okay.

MR. WHITE: Never have.

MR. WEST: I've noticed that. So, Congressman, you mentioned the importance of workforce training. And, of course, there are a lot of worker retraining programs. It seems like many of them are not very successful. How can we do a better job of retraining workers, especially as we enter this digital world and people are going to need upgrade their job skills?

CONGRESSMAN CICILLINE: Well, I think it's important to build up on what Johnny just said. I think, you know, we lived in a country for a long time in which people were discouraged from thinking about a career in manufacturing. In fact, 10, 15 years ago, if you came home as a high school student and said, Mom, Dad, I want to be a manufacturer, they probably were like uh. And I think that is beginning to change.

And I think in part it's changing because, you know, a bunch of things: the Maker Movement; the idea that actually today in order to be successful in manufacturing you need some additional skillset, some postsecondary education. So maybe parents feel like, oh, their kids are still getting an education because they are. So immediately after high school they're both sometimes starting a career in manufacturing, but also going to a junior college or going to a trade or vocational school.

So I think it's beginning to change and I think what we can do is start in high school so that we have really serious investments in career and technical education, so young people who are good with their hands and good at making things are encouraged to develop those skills early on, not be seen as like the oldest worst school in the system in the back, you know. I was very proud when I was mayor of Providence the newest, best school we had was the best career and technical academy in New England and had a longer waiting list than one of the best high schools in the city because the young people deserve that.

So making it a priority, lifting it up, and, you know, preventing teachers and principals from going into schools and saying are you all -- is everyone going to go to college? Raise your hand. And suggesting that if you don't go to college somehow you can't have a fulfilling life. So I think starting very early by valuing manufacturing; reminding people that you earn on average much more in a manufacturing job than a not-manufacturing job, that remains the case, a little over $80,000 nationally; and making certain that we are speaking to employers.

I mean, one of the great successes we've had in Rhode Island with Real

Jobs Rhode Island is, you know, for a long time the Federal Government provided workforce training money and a bunch of folks sat around a table and just developed programs that they thought would respond to the challenges, you know, in the workforce at the time, almost not speaking with employers. And I think what we've done in Rhode Island which is really smart is the governor has led an effort to like listen to employers. Tell us exactly what you need so we can create a job training program to actually meet those needs and with the assurance that when we're done, you're going to have a job for that person, which is where the name Real Jobs comes from.

So I think job training programs are important, but they have to be done right where you're listening very carefully to the employers who are running the companies, who have the jobs today, to find out what do you need, so you're not just training somebody for a job you imagine will be there or a skillset that you think is valuable as a bureaucrat of a workforce training agency in a local or state government.

But I do think the skills gap is real. It's a place where we have to make real investments. If we're going to be successful and to continue to be a leader in the world in terms of manufacturing -- and, you know, coming from a state which was the birthplace of the American Industrial Revolution, as you know, Professor -- we have to really stay with this and invest in it in a smart way and be certain that we're building the public-private partnerships so that employers are helping to shape the workforce training that we're providing that will actually result in a real job for someone.

MR. WEST: Okay. So building on that, Molly, you mentioned in your opening remarks that every sector is going to have to step up, but you specifically mentioned the education sector. So what is it that education needs to do either in terms of K to 12, universities, or some people, like Antoine, has talked a lot about the role of community colleges in worker retraining. What do these different parts of the education system need to do?

MS. KINDER: So I'd answer that in two different ways. And just building on

what the congressman said, I think there is two challenges.

One is how do you build the pipeline now to create the new talents that matches the new reality in the future of manufacturing? So you need to attract folks with math skills and tech skills and interest in the postsecondary. So that's one challenge is building the future pipeline.

I think there's a separate challenge that's, frankly, a very challenging one, which is taking the existing workforce that we do have, that are really benefiting from the jobs that they do have, and repositioning them to meet the changing needs of the sector. And I think they're two very different challenges.

You made the very good point that the education system needs to listen to the employers when it comes to providing that education for the future workforce. I would argue that on the second case the employer should really listen to the workforce to understand their constraints, what makes them tick, what are their -- it is very hard for somebody in the middle of their career with a busy family, a demanding job, to find the space to retrain and upscale on their spare time or even on the job. It's not an easy thing to do. This is a theme we're seeing in all of our interviews with all different types of workers.

It's really easy to get on a panel and say, oh, well, everything's changing. All we have to do is just magically help all workers reinvent themselves. That's actually a very tall order. It's very hard to do, especially as people are older, they're busy into their careers.

Some people, frankly, want stability. That is what we're hearing over and over for a lot of workers. The primary thing they want is stability and the lack of change, and they're going to be facing change and they're going to be facing the need to really adapt.

We're finding a mismatch not particularly in the manufacturing sector, but to the extent some employers are providing educational benefits or some training to their workforce in the anticipation of change. I don't find it very human-centered. I don't feel that it's actually taking into account the real lives, the perspectives, the daily schedules, the child

care needs, the inclination to study or not that's being tied to specific jobs where people can see if I invest this time and energy, I can see where this is taking me.

So I think there really needs to be a real effort to be eyes wide open about how difficult it is for people to reinvent themselves. And for employers to the extent they're going to provide on-the-job training, which is what we're hearing people really want, that's the type of education when you have a busy life. You don't necessarily want to go to school after work or go online. I think there's a real preference for having that happen on the job and being tied to something they can see that they will do. But make sure that's very human-centered and realistic and takes into account people's needs today.

Education, I think there's a huge need. I think we've heard a little bit of the skepticism of this assumption everyone needs a B.A. I think a lot of people want to see that they're studying something that they could really use in the workforce tomorrow, so being really savvy about education allows you to potentially work at the same time that you're studying; apprenticeships, very applied. So many of the jobs of the future, and especially manufacturing, do require postsecondary. They require a lot of math, frankly, a lot of good analytical skills. You need that from an education system.

So it's not something we talk about a lot, but I think there's a lot of pressure on our K through 12 to make sure we get math and more people. Even if they don't like school and they want to immediately go out and work, you need match to be able to do a lot of these postsecondary credentials that will make you thrive in the workplace.

And I think a better integration between the employers who know the future of their workforce, making sure that's integrated with the type of more professionally oriented offerings at community colleges and elsewhere.

MR. WEST: So, Johnny, I want to ask about the role of private companies in worker retraining. So I know you have the Taco Learning Center, so you've invested a lot in retraining your particular workers. Could you tell us a little bit about how your Learning Center operates, what your employee response has been, and how this has contributed?

MR. WHITE: So in the very early '90s, '91 actually, we were confronted with a really interesting situation. We were in a recession in Rhode Island. Taco at the time was very antiquated, very old, very manual. And yet we had a number of companies in Rhode Island that were quite outstanding manufacturing companies: Brown & Sharpe and Cleveland Twist Drill, and a number of others that for one reason or another left, closed or left. So we had on the street a high number of qualified manufacturing people, machinists and whatnot.

And at that same time we began to invest in productivity, a little bit of automation, moving towards process improvement to survive. And we didn't have a trained workforce. So the question was do we hire what's available on the street from some of these other companies or do we train these people? Well, we had a workforce that -- the obviously answer was replace them quick.

Well, my dad and I at the time kind of looked at each other quietly in a room with the door closed and said these people have been with us a long time. They've been loyal. They've been good. We're going to train them.

So I think his greatest legacy as I look back, and he did many, many wonderful things, but I think his greatest legacy was the Taco Learning Center because that was set up originally to each work-related skills: English as a second language, you know, basic math, quality programs, all the things that people needed to grow in their jobs.

But what we learned, and this is just magic, is the more people learn we found the more they want to learn. So they began to request more. This program became much more than, you know, workplace, job-related skill development. It became education. And to the point where we ultimately had a GED program, we had a citizenship program that went on to a bachelor's program, and now we have all the way up to a master's degree in-house. And so this now involves people's personal life. Right? So how we draw -- I found we were drawing people's emotions into their job, you know.

And then we created the Taco Summer Camps for their children. There are

two art and music camps and two oceanography camps, which now drag their families into our company.

And you see, I believe so strongly that a company like Taco -- one of the things about manufacturing that I think is interesting is it's much broader than any one thing. We have everything from high-level management all the way through to the manufacturing process. We start with nothing and give something to somebody all the way through. This, folks, and this is why I believe manufacturing is so exciting, this is what I love about this, this little company, Taco, and I wish others more were like this, is a community. It's not just a workplace. It's doing good things for people. Our objective every day is to make it better, make the community better, provide for people. So there's a whole lot about manufacturing that isn't about manufacturing, if you will.

So did I answer your question?

MR. WEST: You did.

MR. WHITE: I'm not quite sure. (Laughter)

MR. WEST: It was a very good answer.

MR. WHITE: You know, actually you don't really have to ask me a question. I can just go on all day. (Laughter)

CONGRESSMAN CICILLINE: Add one thing to that.

MR. WEST: Sure.

CONGRESSMAN CICILLINE: Because I think this is a really important point that Molly makes and that John just reinforced. This transition to a new job or a new job with higher skills is a very scary proposition for a lot of folks, particularly older men who have done the same job for 30 years. You know, I met a --

MR. WEST: Are you looking at me when you say that? (Laughter)

CONGRESSMAN CICILLINE: No, no, no. I know what manufacturing's like. You know what? I don't want to learn anything. I want my old job back. Like that's how they see the world, so this is a hard thing. And if they don't know at the end of it that

they're either going to be able to develop the skill or even if they do is there actually a job there, it adds to the apprehension in a very tough moment to actually learn a new skill just as a human being. And I think Molly's point is about understanding what that's like for folks.

And I think what Taco does, and Johnny's parents were the same and he's continued this tradition with his sons, is they have done everything to demonstrate to workers in their manufacturing facility that this company really cares about you. And so when there is an opportunity or a requirement that you learn some new skillset they're able to approach it with a whole different attitude of like, A, my company's with me; B, at the end of it I'm going to keep my job. And so everyone's who's been a student, you learn better in that kind of supportive environment.

That is not the case for lots of workers, who are often told, you know, your job is being eliminated next week if you don't learn X and you have six weeks. So, I mean, it's a very hard transition. It's a hard transition because the world around you is changing and everything they've known as a manufacturing worker in this way feels like it's changing and there's an uncertainty about what the end of it is.

I think that Taco is such an extraordinary example of -- it's not only a good -- it's not only the right thing to do as a business leader, it's a good business decision. You heard Johnny say in passing there turnover rate is half of 1 percent. That's extraordinary. They invest in workers and they retain them. That's good for the company, it's good for the workers.

But I think we should really understand that that transition is a really hard and anxiety-filled moment for workers. And understanding that the resources the Federal Government provides to support it, that's critical. But the way it's executed and the attitude and policies of the people implementing it make a real difference as to whether or not it's successful. And Taco is, I think, the gold standard in that.

MR. WHITE: Can I -- I'm sorry, go ahead.

MS. KINDER: I was just going to say, just to reinforce your point, in some of

the interviews we've been doing -- again, not with the manufacturing sector; this is more frontline service workers -- when we hear that they don't feel valued by their employer, that they don't feel the company cares about them, they feel expendable already, they are distrustful of training offerings. They feel like the training is for the company, not for them.

MR. WHITE: Absolutely.

MS. KINDER: And I think this notion that you just said, I value my employees for giving me this service, I'm going to stick with them, I think if that message can be imparted you're going to have a much higher likelihood that people are willing to then put their own self out there and face their fears and take it on.

MR. WHITE: Yeah.

MR. WEST: John?

MR. WHITE: Could I just make a couple of thoughts that I had? One is that -- by the way, on that subject, *Fortune* magazine wrote a little article once about Taco and about the Learning Center back in 1995. And I'll tell you what, if you ever want to go on a speaking tour have somebody write an article about you because it was one year on the road, all over the place. Well, the one thing that I ran into every time I presented on this was this question: What's the payback? What's the payback?

Well, I would say to these folks I never allowed anybody to measure payback. I never allowed it. I don't know what we gained. I can tell you what we saved by not losing people, right? But to me it would just have cheapened it, right, to have somebody think I was doing this for a payback. It was just worth it.

But what occurred to me also was in '92, Taco was about a $30 million company and we had 500 people. And now it's just shy of $300 million and we have 500 people, and they're the same 500 people. And we were able to do that because they were engaged. They helped us grow and develop because they learned.

And so we were able to invest in productivity and robotics and automation and all the things we've done without adding a lot of people, but never sacrificing jobs. The

key is to keep growing, right? But that's an exciting thing for people because they do feel safe, you know.

And so those were just a couple of additional thoughts having listened to both of you.

MR. WEST: Okay, terrific. Let's open the floor to questions or comments from the audience. If you could give us your name and your organization. Right here on the aisle. Do we have microphones? Yeah, there are microphones coming up. On cue. Right there.

SPEAKER: Good afternoon. Thank you very much. Mr. White, I sort of think of you as the "white hat." And so my question --

MR. WHITE: The what?

SPEAKER: I think of you as being like a "white hat" manufacturer. I come from the Fox River Valley of Wisconsin, which is heavily paper manufacturing, as well as port industries. In the '50s and the '60s, the headquarters for Kimberly-Clark was in a small town where it engaged with the people of many of those factories. Now the headquarters is in, I think, Dallas and the factories are pins on maps that are shifted around and opened and closed to meet a global objective.

So my question is how do you grow the midsized manufacturer to compete with the global ones who have a very different vision of workforce?

MR. WEST: Great question.

CONGRESSMAN CICILLINE: Well, I would say first and foremost is to continue to cultivate the best talent. I mean, what really matters for successful manufacturers in large part, in my view, is their access to a talented, skilled workforce. And so I think, you know, there are obviously a whole bunch of other considerations: tax policy and energy costs and a number of other things. But I do think that to the extent that manufacturing continues to become more advanced, more highly skilled, more the kind of advanced manufacturing that requires a higher education, all of that will give premium to a

country or a city or a state that invests in that, job preparedness and workforce training and skilled development. So I think that.

I think making sure that we are investing in developing these ecosystems so we can really compete and that we have good investments in infrastructure and energy infrastructure to try to drive down the cost of operating manufacturing, that's also critical.

And then thirdly, good trade policies so that we're not disadvantaging American-made products by having bad trade policies.

MR. WEST: Molly or Johnny?

MR. WHITE: You know, it's a good question. So we've, by circumstance, ended up acquiring some companies in other parts of the world, okay, for different reasons, strategic, not for cost. Let me start with that, not for cost. And we haven't offloaded any jobs to different countries.

To be competitive, by the way, in manufacturing, labor is not the issue. Material is the issue. Worldwide material price is the issue. And so we all outsource. We have to to be able to stay in business. But just by circumstance we've ended up -- you know, we talk a lot about thinking globally, but acting locally. So, you know, we've grown and developed geographically by acquisition actually more than anything else. We haven't sent off jobs to other places.

Does that somewhat answer your -- is that anywhere near your question? I kind of forgot the original question.

SPEAKER: Well, my question focused on the fact that increasingly manufacturing is no longer grounded in the communities like yours is. Kimberly-Clark was in the '50s and '60s, it was grounded in Wisconsin.

MR. WHITE: Yes.

SPEAKER: In the Midwest. Now it's global, whatever that means. And so the practices and the policies that you're talking about I don't see in my home area of Wisconsin because they see those factories from Dallas as just pins on a map that they

open and close depending on whatever their priority is, whether it's tariffs or whatever.

So my question was how do you grow -- how do you make those kind of companies become more grounded in their communities?

MR. WHITE: Do you want to go?

CONGRESSMAN CICILLINE: No, no, you're the manufacturer. I just want to --

MR. WHITE: But you're the congressman. (Laughter)

CONGRESSMAN CICILLINE: No, I was just going to say, no, I do think there -- you know, I don't want to oversimplify it, but I do think there is low-skill manufacturing. Like in my state, you know, jewelry manufacturing, costume jewelry, like it's very hard to imagine a big successful costume jewelry factory in the U.S. There are some, but that low-skill manufacturing job, those are harder to keep. I think we have to acknowledge that's a reality as compared to more advanced manufacturing that requires a higher skillset, the kind that happens at Taco.

So I do think we're going to continue to see a growth in advanced manufacturing. I think the problem you're speaking about, that's a harder manufacturing operation deck to keep in the U.S., and I just think that's a fact. And that we can still have policies that encourage it and provide incentives. But I do think this -- the growth of advanced manufacturing is actually the greatest opportunity for the country.

It's also the scariest part because the person who worked in the jewelry manufacturing facility that didn't have a very high skillset, it's scary to think about an advanced manufacturing job. So while that may be where the job growth is, we still have deal with this underlying issue of how you get people ready and comfortable for that kind of a job experience.

MR. WHITE: I also think, just really quickly, Darrell, companies have the ability to become part of a community. So when I look at my company, and I'm not talking about everybody I guess, but, you know, I was born and raised in Rhode Island. Rhode

Island keeps consistently getting rated the worst at everything possible, you know, as a state. (Laughter) And it just was rated the worst in bringing business to it.

CONGRESSMAN CICILLINE: Except in congressional representation. (Laughter)

MR. WHITE: Oh, no, no, no. I wouldn't debate with you on that. But, you know, I think that having been born and raised there, as a leader of that company, if I can call myself that, I get it, that's my community. And so let's make this a part of that community in a visible, not high-profile way, but in an important way. The people want us to -- you know, if you ask people to help, they want to help you succeed and a community will do that.

That's where the government -- and the community colleges, by the way, have become a big part in the success of companies like mine because they're really helping with people that are either displaced or afraid or whatever. But to become a part of the community is a very real part of the success I think.

MR. WEST: Okay, there's a gentleman right there who has a question.

SPEAKER: Thank you. My name is Julian. I'm with the Strategy, Risk, and Foresight Initiative at the Atlantic Council. And I have a question for the congressman.

I mean, it's clear that every economic transformation, whether it was from an agricultural-based economy to a production-based and then from a production-based to a service-based and now to an automated society, creates negative externalities. I mean, in the end it may create more jobs than it has destroyed, but most certainly not in those areas. One of those effects is that 25 cities, large city areas, create 50 percent of America's GDP at the moment.

So you have experienced the political atmosphere here in Washington. Do you see that there is the willingness on both parties and the political climate that enables government to prepare the country for the next big transformation that is already going underway, so move people to opportunity, provide finding for those necessary changes? I'd

be interested to hear your perspective.

CONGRESSMAN CICILLINE: Yeah, I mean, I think it's a great question. We just passed the National Defense Authorization and actually in that legislation I included an amendment that was passed by the House that would require the Department of Defense to do an analysis of kind of the long-term implications of automation on the defense sector to really help us, you know, begin to have this conversation.

I think the conversation has begun among many of my colleagues about what are the implications of this and how do we respond to -- you know, a lot of people talk about innovation and technological advancement with great excitement. There are a lot of people who hear those terms who get very, very terrified about their economic future. And so, you know, at least demonstrating to them that people who are responsible in government at the local, state, and federal level are thinking about these issues.

You know, they're not easy answers, but understanding, I mean, do we need to start thinking about displacement of workers and a support system the way we do in trade deals for manufacturing, for domestic manufacturing? Like when your company goes out of business or moves that there's sort of a domestic support for your transition as the same way you would if a company went overseas.

So I think, you know, on the very far left, you know, this idea of a uniform wage in response to a robot tax. So there's a lot of, I think, smart people that are thinking about what are the implications.

I think it's important for the people we represent to at least know that their elected officials are thinking about these issues, a recognition that, you know, these challenges or opportunity are ahead, and understanding what it's going to mean in people's lives and engage people in the conversation. I think very often a lot of -- what I've learned is, you know, a lot of folks that are working in this space, they want to be sure that it's not only being thought out, but that they're part of the conversation; that people are listening to their anxieties, listening to their dreams as aspirations as we think about what are the public

policies that respond to that.

But you're right, this is -- there's not nearly enough conversation about the implications of this on the workforce broadly, and I think we have a lot of work to do.

MR. WEST: Antoine up here in the front row has a question. There's a microphone coming up from behind you.

MR. VAN AGTMAEL: Antoine van Agtmael, Brookings trustee.

I was curious, if you look at advanced manufacturing not every job in advanced manufacturing is the same. And if you can break it down, how much like intake or how much of the jobs there are what you would call secondary school or less, postsecondary school, college, post-college, if you kind of break it down? And then where is this skills gap?

I remember a study by Mark Muro here at Brookings that showed that about half of the jobs in advanced manufacturing were at the postsecondary level, so it creates job at different levels. What is your experience there?

MR. WHITE: That's a good -- you know, Antoine, I can't break it down by percentages. But, you know, a lot of our -- most of our jobs are in the factory, but no means not requiring skill.

Now, here's where I go a little apart from a lot of people. I have always contended that the one asset that's never obsolete are people. Willing and able to learn, they will. And so I have yet to really confront this great skillset gap.

I guess it exists. I hear about it all the time. Somebody said to me one time a long time ago what are you going to do when your people need to be trained? I said train them, I guess, you know. I mean, it's all I have to do. And through that, you know, you can build loyalty.

I don't know, that probably doesn't quite answer your question, but I still believe that I don't see the skill gap the way some people do. Maybe it's because I don't want to accept that because I think something can be done. There's probably a more

educated answer than that.

MR. WEST: So, Molly, in some of the sectors that you looked at, retail and fast food and so on, there's technology coming in. So what are you seeing? And in response to Antoine's question, like what is the education requirement for those new kinds of jobs?

MS. KINDER: So I don't have a -- looking in the rearview mirror I remember reading a statistic that said since 2000, and I wouldn't quote me on this, I would follow up with me and I'll get the exact numbers, but my memory is that since 2000 there's been a third reduction of manufacturing workers with a high school degree or less, so they're really low-skill jobs. And there's been a tripling of demand for workers with a graduate degree, so not even just a B.A., but much higher.

So I look at those numbers and I see, you know, shrinking of a large workforce at the lower end and a pretty big spike in the postsecondary -- not even postsecondary, this is postgrad level. And this was even just since 2000. So I think the numbers are pretty striking.

I don't think that when we look at retail and some of the fast food, you don't see that same massive shift within the same sector. I mean, manufacturing I think is so compelling because of this change from being a very large source of employment for people with a high school degree or less, and obviously other positions, as well, but it's been a very big source of labor and now it's shifting pretty dramatically to be a sector that really is going to be propelled by higher skill talents.

When I look at some other sectors that I'm focusing on you don't see that dramatic shift within the same sectors. So in retail you're not seeing this sudden demand for -- you know, in the mall, for instance, or at the Target in your local neighborhood, you don't see that same change. But I think there is great potential for a shrinking in demand for the super low end of the labor spectrum.

But manufacturing I find has a unique place in the American economy and

as a source of jobs, like clerical work. This is why I'm also focused on clerical work. Clerical work employs so many women an associate's degree or a high school degree and they make a stable, middle class wage. That's what manufacturing has provided to a lot of people.

And there's a dramatic change happening right now in the shift in the skillset. And I think there are huge implications for that and I don't want to sugar coat it. It's very easy to be a policy person and say, well, we just have to do more of this workforce training. I actually think that dramatic shift is going to affect -- even if we do all the workforce training out there, there's going to be a change in the workforce.

And it's going to mean that people right now who have -- I can picture some of the data I've done for Elkhart. You know, if you are a team assembler in Elkhart with a high school degree or less, you make so much more than the fast food worker who has that same degree. If those jobs contract, that has a huge -- I mean, what replaces that from a job production? We cannot expect every single person is going to be the person who has a postgraduate degree.

So I think it's a really big question on job creation. I mean, I think it's going to have massive implications, frankly. And I don't see that as much in some of the other sectors I'm focusing on. The frontline service jobs, you don't see this dramatic shift in the skillset.

MR. WEST: Over here there's a young man with a question. There's a microphone coming from behind you.

MR. WEINFIELD: Hello. Will Weinfield with the National Defense University Eisenhower School.

I believe it was you, Mr. White, that there are conditions present in both Germany and Japan that enable them to have flourishing manufacturing sectors while the American manufacturing sector's struggling. Can you talk about some of those conditions and about how they might be generated here?

MR. WHITE: Yeah. I was pointing to them as examples of countries that have moved ahead with productivity, with robotics, with automation. They've enjoyed the success. And my point was merely that this is achievable, you know.

And by the way, when we look at what some of those countries have done, that's coming here. It has come here. And so I wasn't referring to any specific policies or -- just the fact that we've seen success, which is now coming this way, and it involves change.

Look at Japan. I mean, when I was a kid what was coming out of Japan wasn't certainly what's been coming out for the last 30 years. And so these goals and objectives are achievable and it's back to the goal and objective and the fact that this is the greatest manufacturing -- well, in fact, the greatest country in the world. Right? It's the greatest manufacturing and engineering country in the world.

MR. WEST: In the very back there's a gentleman with a question.

SPEAKER: Hello. My name is Suhail. I'm a consultant at the World Bank right now.

My question is regarding labor regulations and what kind of regulations in the panel's experience it is that workers really want. What seems to be working well and what hasn't been so beneficial from a worker's standpoint specifically? Thank you.

CONGRESSMAN CICILLINE: That sounds like an academic question. (Laughter) Molly?

MS. KINDER: Sure, why don't we just pass this one over to you? (Laughter)

MR. WEST: Yeah, I'm not sure exactly what to say about that. In your research in looking at the local communities what have you discovered?

MS. KINDER: You know, we haven't -- the issue of regulation has not been top of mind in terms of the discussions we're seeing. It hasn't emerged even in my direct conversations with workers. We haven't posed that question specifically.

Job quality comes up a lot. We know the extent to which you have control

of your schedule, are you getting the right hours. You know, we ask people what they value in their job and what they want to see from their employer. Regulations very rarely come up. That isn't to say that there aren't regulatory implications from some of the things we're seeing.

But I know that there's a big conversation in my future of work world with the ways in which technology, apart from potentially impacting your job security, impacts lots of aspects of your privacy, of feeling surveilled. There's a lot of aspects of how technology's impacting the nature of work, that there's a big regulatory and policy conversation happening. It's not something I'm picking up already in the field talking with workers, but I know that's something that's very much on the minds of a lot of folks like you.

MR. WEST: I mean, the one thing I will add to what Molly said is a lot of our current labor regulations were designed for an industrial era and so as we are moving into a digital world we are going to need to remake regulations for the digital space. So we're seeing it in terms of worker benefits, like a lot of the tech companies classify workers not as full-time employees and getting benefits, but as independent contractors. So we need to think about that type of thing. We need to think about the job retraining components. So as we head into the digital era those are things that we need to emphasize.

I think we have time for one more question, so this gentleman right here.

SPEAKER: Hey, I'm Maxwell and I go to Arizona State. And I have a question for Mrs. Kinder.

I was curious, and this is a problem across all sectors, but manufacturing's a big one, is there are demographic differences in racial and gender and urban-rural divides in different sectors. And if like a giant wave of technological unemployment hits a certain sector, such as manufacturing, how can we prepare for negative externalities such as furthering unequal income distributions and negative social discontent that can come from that?

MS. KINDER: You ask a really great question. And first of all, I think

Arizona State, we've spent some time in Phoenix doing some work on the future of work and ASU is really at the forefront of reimagining the role of education and lifelong learning. So just commending ASU.

I think there's a huge question. It's the focus of my research, is who are the communities and the individuals who are at most risk for the negative externalities of automation? So you mentioned race, gender, ZIP Code. And then there's also -- so it's important to be sensitive to be thinking about who's going to bear the brunt of some of the negative?

There's so many exciting positive aspects of automation. I'm not a doomsdayer. I think it's going to -- it's essential for manufacturing that manufacturing reinvents itself constantly, keeps ahead of the times. It's going to be a source of excellent job creation and even better jobs. But even within all that, with change there's always winners and losers. And the implications for the losers can be pretty vast.

So who are the people who stand to be falling behind and what are then the consequences for them beyond just the job, I think is a really important question. From some of our research we're seeing that across not just manufacturing, but across the U.S. economy certainly communities of color are at the highest risk, the Hispanic community being the highest risk that we've looked into.

There's a bit of a difference of opinion amongst experts about whether women or men are more or less at risk. I would say if you average it all out it's about the same, but that still surprises people because I think there's an assumption that it's men who are primarily at risk.

And then there's age, so young and old are both of concern to me. And then ZIP Code certainly where we expect to see on net more job loss than job growth in this new world is smaller towns and rural regions compared to some of the big mega cities.

So there's very big distributional consequences of some of the changes. And certainly, from an educational standpoint, the least education is the highest risk

compared to the most education.

And, you know, something that we've been grappling a bit with some of the communities we're going into is, well, what does this mean? It's not just people's jobs. Jobs are very emotional. I mean, it provides so many things. I mean, we expect what would this mean from a social cohesion point of view? What does it mean from people's marriage, their family, the next generation's ability to have a future, for things like drug and alcohol abuse, mental health?

There's all sorts of ripple effects as you can imagine from a negative. But I think it's an important question to raise is how should we think about who stands to fall behind? And then what are the consequences and what do we do about it?

And I will just say that we've had some interesting conversations in South Bend with Mayor Pete Buttigieg, who's now on everyone's tip of their tongue. Pete has had some really interesting things to say about the way the community needs to step in for what the workforce used to provide. That sense of stability and community, it's not just from a job anymore.

So there's big questions about what do we need from a community coming together apart from just a job to think about some of those changes and make sure we're meeting who are there? So great question.

MR. WEST: Okay, we are out of time on this session, but I want to thank Congressman Cicilline, Molly, and Johnny for your contributions. So please join me in expressing our appreciation to them. (Applause) Thank you very much.

And I would like to invite our second set of panelists up on stage.

MR. WEST: Okay. This panel is going to follow up on the conversation we just started by talking about what it is like being on the frontlines of manufacturing. Because each of these individuals are on the frontlines.

To help us understand this topic we're pleased to be joined by three leading experts. So Buckley Brinkman is the Executive Director and CEO of the Wisconsin Center

for Manufacturing and Productivity. So we wanted to get a Midwestern perspective on some of the things we've been talking about. They have been working on a productivity project that is very interesting, so we want to hear a little bit more about that.

David Brousell is Vice President and Executive Director of the Manufacturing Leadership Council of the National Association of Manufacturers.

And then Cheryl Merchant is the President of Taco Comfort Solutions. And previously she served for 19 years as President and CEO of Hope Global.

So I want to start with Buckley. Tell us a little bit about your Center for Manufacturing and what do you see in terms of the challenges for manufacturing?

MR. BRINKMAN: Sure. Thank you, Darrell, for inviting me. We're very proud to be the Wisconsin element in the national midst, MET, national network. So every state has a center like the WCMP, and we all focus on those 98 percent of the manufacturers that are small or medium sized.

And I think one of the big things that we see affecting our manufacturers is just that the skills gap now has turned into a body gap. Where before when you had the skills gap you had jobs over here, you had people over here, trained the people, they could fill the jobs. Now those people are more and more not being there.

We're seeing the projections for the workforce for the next 20 years to remain flat. And in fact the only population age group that's growing in the workforce is 55 and over. So it's a pretty stark picture if you realize that GDP depends on the growth of the workforce plus the growth and productivity.

So if you want to have a three percent productivity growth and your workforce is growing at zero, it means you need about a 35 percent productivity growth over a course of a decade to get that three percent. And the trick to that is we haven't seen that kind of productivity growth since World War II.

So in Wisconsin we focused on that. Our goal is to get individual manufacturers to grow their productivity at 30 percent or more. And we've undertaken this

with the State of Wisconsin to look at how can we make that happen. And what we found out is a couple of things.

The first thing is that every manufacturer is different. There might be a hundred different solutions that work, but the three solutions that work in Company A are not going to be the same three solutions that work in Company B, that work in Company C. So it's very important to get the most leverage approaches to that situation.

The second thing is that when you attack this it goes through a very logical progression. Where we see companies starting out is first. If you haven't gone back and looked at why your customers write you a check, how you create value, in the last five years, chances are you're missing something. And if you jump into automation or applying some other kind of technology, you're going to do one of two things. You'll implement the wrong technology in the wrong place in the wrong way, or you'll automate something that shouldn't have been done in the first place.

And so then once you have that baseline you can then move to automation because you know where you can apply the technology and then ultimately move to connective devices and the Internet of things because you'll have that base of technology that's working and can be connected. And we're seeing those results of 30 percent or more.

MR. WEST: Okay. David?

MR. BROUSELL: Yeah.

MR. WEST: What challenges are you seeing in manufacturing, and how should we address them?

MR. BROUSELL: Well, where should I begin, we have so many. But we have so many opportunities too.

So the Manufacturing Leadership Council part of the NAM is dedicated to helping manufacturing companies transition to the digital age. And we do a lot of research around this transition. And some of the biggest issues that the manufacturing community is facing in making the transition really fall into three categories.

One, it's understanding the new technologies that are coming down the pike that they have to incorporate in their companies now to take advantage of the digital trend. Things like advance analytics, artificial intelligence, 3D printing, collaborative robotics, and a variety of other technologies.

The second thing they have to understand in order to make the transition is what impact those technologies are going to have on their organizational structures. How they design work, how they organize their companies, how they are going to react and deal with a long-term trend that's been going on from moving from command and control hierarchical structures to more collaborative work environments.

And the third piece is what impact this is going to have on leadership within the manufacturing companies. As many of you know, and we've been talking about the workforce issue, one of the major planks of the workforce issue. There's three major planks, but one of the major planks of the workforce issue is the retirement of the baby boomer generation. And this effects all job functions within the manufacturing companies, from plant floor people to people up in the C suite.

So we look at what impact the digital model is going to have on the leadership piece. And what we have found is that leaders not only have to maintain their competencies around making money, building products, understanding customers, running a company, meeting payroll, but now they also have to develop what we call a new layer of competency called "Digital acumen." And there's a few parts to digital acumen.

Number one, manufacturing leaders have to understand the potential of these new technologies. And it's not just potential around creating new operational efficiencies or higher productivity, it's also around the idea of looking at those technologies, really understanding them, and saying "What new business model could I create around those technologies? What new service might I be able to wrap around an existing product based on those technologies? How can I use those technologies to really understand my customers better?" This is all about become data centric within the organization.

Another key piece of this has to do with understanding the impact, as I mentioned, around the organizational model. As we're going through this shift from managed control to collaborative, leaders are faced with a new challenge. How do I deal with manage employees who are increasingly empowered with more information? Where the availability of information is making it possible to move decision making further down the line. How do I deal with that as a leader in a collaborative environment? That's requiring a great deal of change.

And leadership is also faced with the deed to, as they think about the trends of digitalization going forward, how they're going to operate in a broad eco system of partners, customers, as well as their employees. Because it's all about leveraging as many brains, if I could put it that way, within your business eco system as you can. The future will be decided, the winners will be decided by those who can really leverage the data effectively within their organizations. So there's a lot of challenges before manufacturing companies now as we move forward on this.

And you know, every industry has been disrupted. Hospitality has been disrupted, transportation has been disrupted. How many people today came here in an Uber? There you go, right? Banking is being disrupted, medicine is being disrupted, healthcare is being disrupted. It's manufacturing's turn now, but I think it's a great opportunity to deal with some of the issues that we're facing not only around productivity, but also this big workforce question that's at the center of everything.

MR. WEST: So, Cheryl, David makes it sound like you have a really tough job. You're leading a manufacturing company now. You realize you have to do all these things? What are the issues that you're focused on?

MS. MERCHANT: Well I will say one thing, I don't look at it as issues, but opportunities. They are actually opportunities. And one of the greatest things with manufacturing, and I say this with all honesty, I have probably 35 years in manufacturing, so I visit the hairdresser a lot.

We have the greatest asset in the world, and that is, if you caught the drift, I work for Mr. John Hazen White, and so believably, we have the same beliefs in the fact that people are everything. People are everything about your companies, your opportunities, your growth, your focus where it should be. So it's not just about the training, but it's about understanding them. It's about looking across your workforce and saying "Wow, I got four generations here." Taco will be celebrating a hundred years next year. I'm pretty proud of that.

But that also means that you have a lot of employees that they've been there for 40 plus, right. And then at the same time you're also, we've hired I think somewhere in the neighborhood of 40 new people just so far this year. And they're everything from interns, fresh college kids, to people that have 40, 50 years' experience as well. Because we really believe in that integration across a workforce.

So looking at how to take care of the needs of that kind of a diverse workforce is huge. And then you've all hit on it as well, there's 20 percent, at least, of our workforce that's thinking somewhere in the near future of retirement. And when you're looking at a strong manufacturing operation you're looking at some real expertise that's, as John mentioned, very difficult to replace.

So what are we going to do about that? We're going into internship programs, mentorship programs, the training. It's for our own people, it's not just for folks out, you know, in our customer base, but, you know, attending a pump class, you know. Its good things to do. Learning to do a resume or learning how to do an appraisal of your people. Those are all great things that we're constantly training everyone on the inside and out.

We've established some, we've taken our training program also to start looking at Finance 101, Supervision 101. And also making sure that we have a class on the history and the background of a company such as Taco. Because when you work with the White family, he's just a legacy you don't want to lose. And carrying that forward is really

key to our workforce.

Besides that kind of training, you mentioned the communication and the information. I think it's fabulous that people have more information. That person on the job, he knows why he's doing it, what's behind it, you know, what's went wrong, what's went right. There's nobody that can help you more than the person that does the job. Nobody.

A long, long time ago I knew that if I could just get into the hands of the people doing the job, the information from the financials, what was going wrong, they're the ones to help you solve it. And we've went a long ways, somebody mentioned about how Rhode Island is the foundation. If you're ever had the chance to visit Slater's Mill and you hear the stories on how manufacturing was started with indentured servants and kids. You're not supposed to talk, we don't want your ideas, put that part to this part and make it happen.

But now everyone, talk about grade levels, I heard that question answered. We're looking about analysts and problem solvers. And it's nothing to walk the floor, as Ben White would know, to find that an assembler has somehow managed to get himself a supply chain degree. Right? And is interested in opportunities. Or they, you know, that clerk, that personal assistant you have, just took a class in finance, and now is taking on insurance information and taking on one more job.

So the dynamics of what's really happening in manufacturing, they're all opportunities. And they're opportunities because we're dealing with people, and that doesn't stop. You talk about even automation, you know, you go to the guy that, again, maybe, you know, he's account inventory but now he's carrying these cool looking RF units, right? Customers use radio focus and scanners to do what they need to do. Or they're putting all their information into a NRP system and actually understanding all the stuff for what they need to do.

And there was a point in my career where I actually helped teach those classes. And I remember, and I still have the little angel that one of my ladies gave me back

in Ford Motor Company for having not what she thought would save her job, but taught her how to run a computer. And she was so thankful and grateful. And John brought that up as well that people want to learn. And I had a mentor tell me nobody gets up at the start of the day, putting their pants on, and they're like let me go see how bad I can do this job. Nobody.

So it's our responsibility, you are right. Leaders have the responsibility of making people feel fulfilled, you know, of engagement. It's not just a communication, it's a two-way, it's communicate and engage.

I had a director of organizational development in my HR Department just informed me of that the other day. It's not a communication plan, it's engagement and communicate. Okay. She's absolutely right. Because people want to feel as part of the growth, they're important. And at Taco they get to do that and it's pretty exciting. So it's not challenges, it's fun. Especially when you work with them.

MR. WEST: Okay. So, Buckley, we've been hearing about the need for organizational development, the challenges of an aging workforce, how to integrate IT into new business practices. The companies that you work with in Wisconsin, how are they navigating this new terrain?

MR. BRINKMAN: Well, it's a challenge for them because they're smaller companies. And so I like what John said earlier, I don't recognize the skills gap. What we see are those companies that are at the leading edge, don't see that. They're getting their pick of the crop of people who want to come to work for them.

The issues of when you start looking at the workforce that's available now you're into non-traditional areas, people who are chronically unemployed, who are disabled, who are recently incarcerated. So on the positive side there's now an economic incentive to bring those folks back into the economy and back into the workforce. And with the smaller companies they have to do smaller experiments, you know. For a General Motors to invest a million dollars and try something out and have it not work, okay, it's a million dollars. But for Bill's Bait Shop and Metal Bending, a million dollars could be more than they even sell in

a year.

So those experiments have to be small. And I think what we're going to see is a real change in learning. I mean we're going to all have to be constant learners, and I think the structures that we've had in the past to teach are going to have to adapt to that too to people who are, you know, older, coming back in and saying, hey, how do I retool so that I'm actually relevant with the technologies that are going forward.

MR. WEST: So, David, in the national survey that we did, we found 50 percent said they think the government should be doing more to help the manufacturing sector. So I'm just curious, in your perspective, what do you want from government, are there particular incentives or programs that you think would be helpful, or do you just want them to stay out of the way and not interfere?

MR. BROUSELL: No, I actually believe that for us to be able to make the journey to a digital future, it's going to require education, it's going to require the government, it's going to require manufacturers, and it's going to require the general public to understand what the transition is going to be for us to make this. We need a community, a coalition, to make this transition successful. It's way too big just for the manufacturing sector itself to try to undertake because we need qualified people coming from the educational community and who have these digital skills. We need government to put in place policies and incentives for investment and innovation around the digital model. We need manufacturers to really pick up the pace of the United States with this whole thing because our studies have indicated we are somewhat behind other countries like Germany and Japan in this race.

This race is going to define the 21st Century, I believe. That those countries whose companies successfully embrace the digital model will be the powers of the 21st Century. Because manufacturing is the core of the economy. So there's a lot at stake here.

And just to go back to the core of your question. The government is actually doing a lot more than a lot of people think. In October of last year the Commerce

Department put out what is called the National Strategy for Advanced Manufacturing. And this was an effort that had gone on for over a year, it involved multiple Federal agencies, they did about 22 focus-like groups around the country, the NAM held one in January of 2018. They published this big report essentially calling for the coalition I'm talking about.

In October this was pursuant to the 2010 law that was passed during the Obama Administration that created the institutes, the 14 institutes. So by law they have to update this strategy every certain number of years. So they came out with this report. It's actually quite good as a starting point. The problem with it is not many people know about it. Has anybody in the audience ever heard about it? One or two hands.

So we need to get greater exposure and awareness about some of the things that are already going on with this because a lot of good work has been done and a lot of the pathway has been cleared on this already. It's also true on the workforce side. There's a tremendous amount of things going on to deal with the workforce issue.

As many of you know, we have hundreds of thousands of jobs open in manufacturing. The latest numbers we have at the NAM is that there's about 509,000 open jobs in manufacturing as of May. We're projecting that by 2018, there's going to be 4.6 million open jobs in manufacturing.

The good news is there's a lot of companies that are attacking it, making relationships and alliances with their local colleges and universities. They're developing new programs at the HR level to attract employees. We spend a lot of time at the Council, the Manufacturing Leadership Council advising our members on employee engagement, exactly what you had mentioned.

In fact we're about to publish an article next month that advocates taking an idea from the consumer space, which we all know is called the customer experience, and creating in manufacturing what we would call the employee experience. So we can move that needle beyond just engagement to something where we can really work the whole issue of retaining employees, making them feel that they have fulfilling work, and wanting to

pursue a lifelong career in manufacturing.

So we're all working on this. I don't know how many of you noticed, but last week the NAM made a major announcement around a new program called "Creators Wanted." This is going to be an 18-month initiative by the NAM, one of the biggest in its history, that is going to go out into the manufacturing community, and the goal is to raise $10 million to fund a digital campaign to raise awareness of the future of manufacturing and the great aspects of having a career in manufacturing. We're going to be doing a nationwide tour of up to 22 locations, 25 locations, I'm sorry, in the United States, kind of a mobile tour to show people firsthand what modern manufacturing looks like. It's not the dirty, dark, dangerous -- it's not your father's Oldsmobile. Remember that old saying? Your father's Oldsmobile manufacturing anymore, it's really changing.

And there's other aspects to the Creators Wanted Campaign. You're going to hear more about this as we go forward. But just to sum up, I think that, you know, as long as I've been in manufacturing and probably as long as you've been in manufacturing, and John and everybody else, the jobs issue, the skills gap issue has been a front burner issue. And we've worked at it for many, many different angels.

But now something has changed. The man on the white horse we've been looking for has arrived, and it's called digitalization. This is the thing that's going to change peoples' minds and perceptions about manufacturing. Once they get a look at it and understand it, the type of jobs that you're going to be able to have in manufacturing going forward, it's going to turn on a whole new light about what manufacturing is. And that dark, dirty, dangerous image is going to be completely blotted out by this new light.

That's my belief and my hope. I think we're at an inflexion point. It's a huge opportunity, and if we can make the most of it, we can completely turn around that perception and start supplying those people we need in the workforce.

MR. WEST: Interesting.

MS. MERCHANT: Can I add to that a little bit, because the Congressman

mentioned a little bit about Rhode Island's Real Jobs efforts. And I had an opportunity to sit with our governor on the Workforce Development Council, and what you ended up with government supporting the relationship between companies in needs, such as Taco or Hope Global, is where I came from, as well as the amazing universities that are around us, and bringing those together.

And Taco has now taken that and is working on a very structured program of working with the universities and talking about their supply chain classes or their engineer groups or their capstone or their marketing groups, and finding out and tying that to what do our own executives need and help and solve this problem for us on the floor. What can you do with us?

And what you end up finding is you bring these young adults, these bright minds in, and then you create a job because you cannot let that person go. That's called job creation, right? It's not that I've got a job to fill it, but wow, let's create whatever this is so that we keep doing these kinds of things.

And so tying and utilizing your universities and letting that awareness happen. Because it is about awareness. We've done internships for high school students and just taken them through from an engineering department to the auto clad group to the guy on the floor that's learning about facility management or, you know, how to set up a tool crib, or the finance guy. I mean there's such a diversity, it's not just the assembler. It's not just the guy working in the warehouse driving a forklift. There is so much in manufacturing and so many opportunities that no one knows about. You know, to be a master scheduler and/or a buyer that's dealing with India and China and all of the supply chain that we're dealing out there. That's not little stuff.

So the opportunities are really tremendous, and I think that awareness is just coming back around that manufacturing is absolutely important and there's opportunities for growth.

MR. WEST: In your opening remarks you also mentioned about the

importance of communications and engagement. And in your company you have an interesting situation in the sense that because you have low turnover, you have four to five generations that are working side by side. So you have an aging workforce and then young kids.

MS. MERCHANT: And they all want something different.

MR. WEST: And that's what I wanted to ask you. How do you deal with that particular configuration?

MS. MERCHANT: By doing exactly what John talked about, and listening to them. So you have an aging workforce that's getting older and they don't have the little kids, so maybe the camp doesn't work. So this last year instead of a fancy awards dinner we, my 10 year old, by the way, thought this was really amazing, I heard her telling her girlfriend on the phone "Mom's company just shut down the zoo and took over." So she was so excited she couldn't believe it, that we literally opened up Roger Williams Zoo, when you talk about joining community, and had over 700 of our employees and families that came to that day, and everybody absolutely loved it. And so listening to what they're looking for.

Talking about the flex hours, I heard somebody talking about that. When I came in, there's no quite start and stop time in a lot of areas. And how we're all engaged in figuring out what works for this group, but what works for that. And you got that group. They got that group that's been 40 years, and I like coming to work right here and I like knowing what I have to do and going home on time because they've got that other life. So you have to listen. It's so key, and then follow through on it.

There is a list, there's everything from Johnny's Clock House Tower meetings to the town hall meetings to the luncheon efforts, and that's just beyond the training. There's just constant communication at all levels of engagement. And the deal is with no agenda. Just go in, talk, listen, and work back and forth. That's what's creating and enhancing the culture.

Which is back to some of the other things I've heard about culture, culture is

everything. People need to be happy going to work. They do work great things and they're happy.

MR. BRINKMAN: I think we're going to see that, I see we're going to see a couple things change too. One is that when people realize that there's not another employee at the door you're going to treat those folks that are in house a lot better than what you maybe have before when you could say "Well, Cheryl's not doing the job, we'll get rid of her and find somebody else to come in." If the spot market for labor is going to be zero for the next 20 years, you're going to think a lot differently about how you approach Cheryl before you do that.

Then the other piece of this is we're seeing when you're taught before how industry's moving towards education, we're seeing education move towards industry too in that all of our technical colleges now in Wisconsin have industry advisory panels where they are active partners with what's being offered to industry. And the state has gotten involved too, we're providing what they call fast forward grants to actually fund targeted training for particular manufacturers. So it's having a big impact.

MR. WEST: David, you wanted to jump in?

MR. BROUSELL: Yeah, I wanted to make a comment of something that was on the other panel which I found really interesting, just to go back to this. The numbers problem that we're dealing with here in the industry and the impact of automation and advanced technologies on the overall workforce.

Of course there's going to be an impact, but our problem is not displacing people, our problem is filling the open jobs. So the retraining is absolutely critical so we can reallocate people. And I really empathize with what Molly said about how difficult it is for people to make this transition.

I had to make one mid-career myself and it wasn't easy. So I really, I feel that too. But when I think about it, you know, we're the people who make things. And if we can make a jet engine, if we can make a medicine that cures a disease, if we can make a

microchip circuit that has more information on it than the entire Library of Congress, we can figure out how to retrain if we put our minds to it. We have some of the best minds -- I come out of the publishing industry. The manufacturing industry has some of the best minds I've ever encountered.

If we put our minds to it, we can lick the retraining issue. Because if we can do those other things we can do this too. If it's a manmade problem. If it's a manmade problem, a man can solve it.

MR. WEST: I like your optimism on that front.

MS. MERCHANT: He's absolutely right.

MR. WEST: Let's open up the floor to questions and comments again, if you can give us your name and your organization. Yes.

MR. DATAC: Hey. My name is Alex Dadok with Fahe, and I was curious. I'm really happy about the optimism as well. It often seems like these are questions that are sort of political will questions to sort of implement, you know, things to catch people before they fall. And so I'm wondering if you could talk about that.

But also particularly if you could address how you see labor unions fitting into this conversation. I haven't heard a whole lot of in-depth discussion about labor unions. And in the past those organizations provided impetus for sort of retraining and programs and sort of taking the sort of solidarity of taking care of each other that I think we maybe see a little bit missing in not the companies represented here today, but in many companies around the country. Thank you.

MR. WEST: Okay. Responses?

MR. BROUSELL: I think labor unions have to be part of the coalition. They're one of the constituencies. We have to have the voice of them. There'll be other constituencies perhaps we haven't thought of, local communities need to be constituencies in this movement to the digital era, which is what I'm talking about.

Everybody needs to be at that table to make this a successful transition.

People have stakes in it, they're going to have a lot of opportunity in it, it's going to be challenges, but we all have to be deal with it together if we're going to successfully make the journey. That's my perspective on it.

MS. MERCHANT: So I come from the automotive world, start with GM, Mazda, Ford, their corporation, worked with labor unions in Mexico to Canada and across the world. So I've got a really mixed bag of what's good or bad in both. But I think, you know, David hit it right. The fact is if you're going to succeed, and that's what we want to do, we all want to succeed, right? The suppliers want to succeed, the customers want to succeed, the people want to succeed. They want to come to work and they want to be a success. And the company needs to succeed to thrive. So everybody's got to be in the same boat.

And it doesn't do any good to point and say I'm sorry but your end of the boat's leaking, because you're in the same boat. So we have to fix together all these issues, and it can't be, you know, back from the days of labor against, you know, management. That doesn't work anymore. You know, to come in and ask "Are you paying a shift premium?" Of course we are, you know, the things that need to be done right are being done right. Now let's figure out how to go forward and improve upon it in the next stage. So everybody needs to be at the same table.

And I would say the same thing whether it's in the political realm. There's a lot of stuff going on in the world, across the world. We talk about being global and then having impact and understanding what your actions do as a company. And as Johnny said, we are across the world but we are not there because of cost reasons, we're there because of a vertical integration and strategic place. But that doesn't mean that, you know, we shouldn't implement in our Vietnam plant a pay card instead of handing people a pile of cash and sending them out into the street knowing it's not safe. And what socially should happen, you know, it doesn't matter where that's at.

So when you think global and local, then there's right. And I don't really

care what realm it comes from, I don't think the way it used to be works. And it has to be everybody in the boat for true success. There's no more lone rangers.

MR. BRINKMAN: And I think where we started this, with the challenges, is forcing all of us to play a much more focused role in doing the right things. I mean it's not only good for the business, it's good for society, and you need it to be able to succeed.

I think that one area that we get absolutely sidetracked with is, you know, if we need more people, can we really step up and start talking about immigration and something that's less than screaming tones?

MS. MERCHANT: We just got done with a three-day strategy meeting with the top, as many people as we could fit in the room that we got. And battled out where we were headed as a company, right? Everybody talked, everybody got into. But we started and came to a full conclusion, our vision starts with the words that Taco is dedicated to promoting the success of our employees, our customers, our partners, and our communities that we do work with, for the betterment of all, right?

So when you believe, when absolutely everyone believes that that's where you're going and that's what we're committed to doing, then, you know, you can't help but have it happen.

MR. WEST: Other questions?

MS. HOME: I'm Jean Home from National School Boards Association. As you said just now, education is moving towards industry. At NSBA things this year we initiated life ready skills. So we study skills gap from the manufacturing perspective. Would you think that school leaders should prepare to cater to our students for the future with challenge brought by the automation technology?

MS. MERCHANT: One of the areas that I would bring out, and in fact, Bryant University had gotten with Taco because we had come across this because of our training center. But there is a huge move to digital training, putting on the goggles and learning how to do your job and building a pump and watching -- and everybody was

standing around this guy, standing there with absolutely nothing in front of him, with goggles on his head, running a job. So that kind of thinking, those kind of classes on everything the workforce is looking for. That's where our education needs to go.

MR. BROUSELL: Yeah. And you know one of the big effects of digitization, and we've been talking about this at the Council since its inception, is it kind of starts to force what we call cross-functional integration in the company.

Most manufacturing companies, most companies of any type over the years have really been built around silos. And the digital technology now enables us to kind of break down those silos. And in manufacturing, some manufacturing companies are now experimenting and even implementing what we call the digital thread, to tie together in a full life cycle, 360 degree life cycle paradigm. For example a products life, everything from conception to design to building the product to shipping the product, to the customer, the service of the product at the customer, and then back in a digital loop.

So when you have this sort of effect within the company, it completely changes how you have to go about managing things within the company. And I think we're going to see a lot more of this going forward. And it's going to affect how we do things and how you manage. It's going to affect, if I can put it this way, the politics of the company. Because we know that power exists with information and that sort of thing, it's going to kind of break that down in much more of a meritocracy I believe, going forward. And I think coming out of it we're going to be able to be much, much faster, much more agile, and we're going to be able to supply products to customers that are much more precise as to what they want, the whole mass customization trend.

So I'm very optimistic about it.

MR. WEST: And I want to pick up on the agility theme in the sense that in terms of preparing young people for the future, I would really emphasize the importance of soft skills.

MS. MERCHANT: That's just what I was going to say.

MR. BROUSELL: Yeah, all three of us.

MS. MERCHANT: You cannot lose that.

MR. WEST: Because one of the interesting insights from Charles Darwin when he was discussing evolution, was he said "Survival is going to go not to the strongest or the most intelligent, but the most adaptable." And I've always thought that as we're moving to the digital era, that insight is really important. Because we're heading into an era of massive change on every front. Technology change, business model change, geopolitical changes, changes on the global landscape.

Young people are going to live through much more change than I have lived through over the last few decades. And so therefore one of the best skills they're going to need is just adaptability, resilience, being able to see changes that are taking place and figure out how it's going to affect them.

I don't know exactly how to teach those types of skills, but those are skills that will be very valuable.

MR. BRINKMAN: I would take it one more step too. I would say the adaptability personally, but the ability to bring other people along with you and be able to work in a team and move that team forward to a goal that's becoming more and more important the more technology becomes part of the factor.

MR. BROUSELL: Yeah. And if I can build on what you said, Darrell, along with those soft skills we need now and we're going to need even more in the future, people who have real critical thinking skills, collaborative skills. This whole cross-functional movement requires people to work in environments with people from functions that are very different than those that they're in.

One of the things we spend a lot of time with the last number of years on at the Council is how do we bring together in a manufacturing company the OT people and the IT people? Everybody's struggling with it. They speak different languages, they have different perspectives about the technology. A person on the factory floor and operations

technology, they look at a piece of technology and they look at it, that's going to be there for 25 years. That's how they think about it. On the IT side, 18 months, follow's Moore's Law, right?

So bringing these two groups together in companies has been a real challenge for most manufacturing companies. They're working on it, they're trying to make headway on it. A lot of them are starting to succeed with it. But we're going to see a lot more of it kind of across the lifecycle.

MS. MERCHANT: I got an add on for that soft skills thing though. Show up on time, respect people, you know. You know, we say that we're full of a world of meetings, but do you know how it is to have a number of people sitting there and everybody waiting. You know, respect other peoples' opinions.

We just got done, when I was talking about this strategy meeting. We started with "What are the rules of engagement?" Shut your electronics off. I mean that's okay, shut your electronics off. Listen to people. You know, it's interesting, you know, we're sitting at a four-way stop and again, my 10-year-old says "Mom, do they know who's supposed to go first?" I said "Well they're supposed to take turns." And she said "We learned that in kindergarten."

We forget some of these things. Take turns, listen to other people, you know, some of these basic soft skills. And don't be afraid to work. And, you know, yes, go do the job. You see it needs work, you know somebody needs help, just don't be afraid to do those things. And how we teach it I don't know. I'm from the Midwest as well so I learned it on a farm, so I don't know what to say to that, but.

MR. WEST: Right there is a question.

MS. HOOSEN: I am Marilyn Hoosen. I saw a study by Pejum recently that said that by 2030, 70 percent of all of the world's cities will have had rapid urbanization occurring, right? And so what kind of planning do you do in the manufacturing sector when you think about where you're going to source your resources, so rare earth minerals and,

you know, copper and all of those. As the population demographics globally explode there's a demand everywhere by manufacturers and infrastructure planners and so forth to be able to meet those demands. But I'm sure there's a fight for those resources. How are you planning that over the next 10 to 12 years?

MS. MERCHANG: Well, John hit it, people's not the problem, it's materials, right? And it's on time deliveries and it's, you know, there's all sorts of phrases from the just in time to the general consignments, and how do you deal with the getting the supply chain from India and China and building all of this up as well.

So it's critical, there's numerous programs being studied, it's, you know, you can't carry millions of dollars of inventory to be prepared for the distance of where your supplies are at, right? So how you deal with it and how people are, you know, back to your commentary. I think the good part is even though that urbanization, you've got the community, it's not being as lost as everyone thinks. There really is absolutely this wonderful world of building closer and helping each other.

You get down into automotive, they actually will bring all of their supply bases right on house, you know, and they build upon this fracture that, you know, come inside this walls because we're all going to work together kind of thing. So there are so many different programs out there, what's the best one, I think it's individualistic.

MR. BROUSELL: Yeah, it's a great question and it's kind of a story about this. So we started studying future production models at the Council maybe seven, eight years ago. And when we first started going into this I kind of had in my mind that the result that we were going to get out of this was that companies were going to create real big mega super factories. This was the way it was going to be.

I was fairly quickly disabused of that notion because what was really going on was production was, and still is, becoming democratized. We now have the ability, production wise, to put production capability much more locally, much more close to the source. You'll see an explosion of additive 3D printing manufacturing production means in

many, many areas where even the big companies, you know, even big automotive company, you may need an automotive part. Rather than them ship it to you, they'll send a signal to a 3D printer in your house and you'll make the part yourself and you'll put it in your car.

So the model of production is shifting and I think what we're going to see if the urbanization trend holds out, we'll see production capability much closer to the source.

MR. BRINKMAN: I agree with that, but I don't think it's going to go all the way to that, you know, everybody's making their own parts.

MR. BROUSELL: No, no.

MR. BRINKMAN: Because there are a couple things, that this new technology does take capital. So you need a certain amount of skill to be able to implement that new technology. And when you implement that technology, then every time you connect to the Internet you also have a cyber security threat. So implementing those safety features also takes money and effort and it takes a little bit more scale than just everybody being able to do that. And at the tail end of the supply chain, that's what we're finding out right now is that, you know, that's where cyber criminals are coming in now and coming up the chain.

MR. WEST: But I have to ask about that 800 pound gorilla on the supply chain issue is just all the geopolitical changes that are taking place at a very rapid pace. So I'm just curious how that is affecting the people you work with or, in your case, the work that you're doing, how does it affect, you know, where you're ordering materials?

That will be recorded --

MS. MERCHANT: That gorilla, it's not a gorilla, it's an elephant.

It's difficult. There's no good way around it. But no one's winning at this right now, all right? So, you know, you start talking of tariffs, what happens, you know, parts goes up. Someone's going to buy a furnace for your house. Who do you think's going to pay? It just keeps getting pushed along, right, and nobody's winning. So that's one piece to it.

But to go all the way back, companies are finding methods. I mean my head of the supply chain for Taco right now is in India. And talking to these suppliers and saying we got to work together. You know, remember that boat thing. What can you do, what can we do, so that we can meet the needs of our customers. That's what has to happen.

And it doesn't matter, I mean whether government's making it easy or hard, that's what you have to do. And there's some that are not surviving. And there's regulations that are being put in place, you know, the Department of Energy putting in certain restrictions that you must be to this level by the end of the year or you cannot ship. Companies better be listening and keeping track of those kind of regulations. And they're for the better, right? We need to do it. And John made a comment once in many cases Europe is already there. You know, they've implemented this stuff, they're working on cleaner air, they're working on what they should be doing. We have to get on board and do the same things and we have to be listening to those kind of regulations. But at the end of the day everybody's in the same boat. And you gotta work together and you gotta come up with solutions and you gotta figure out how are you going to make that supply chain flow like it's supposed to, or the customer goes somewhere else.

MR. WEST: Antoine.

MALE SPEAKER: You talked about collaboration with universities in the area of training. I wonder whether you also can look at them for the fruit of their research in terms of new materials, in terms of new production techniques. And do you work with them on that as well?

MS. MERCHANT: I have, I believe, to be prudent, six months at Taco. I just touch on the borders of it, and they absolutely have, many times. We also did when I was at Hope Global with the textile universities. And some of the brightest minds in these universities with the teachers and the faculty. So, yes, the answer is absolutely yes, the smart company is doing it every time. So I would say both from Hope and Taco they have

reached out and looking at new products, and saying we need a product that's going to do this. Help us out.

MR. WEST: What's your experience in Wisconsin?

MR. BRINKMAN: Well I think, I mean our experience is that the universities work very well with the larger companies. You know, when you go to the university, one of the universities, one of the first things they're going to be figuring out is I need some funding for this research. And so for a smaller or medium manufacturer it's very difficult for them to connect.

It's also very difficult from a timeframe perspective. You know, small or medium manufacturers looking to a 12 to 18-month ROI on an investment that they make, and a lot of times when you talk to the researchers at a university they're saying well we'll get this down to where it's within three years of being market ready and then we'll move it into one of your manufacturers and help us get it the rest of the way. Well, you know, those manufacturers have orders to get out and they're not really -- their purpose for being is not to further their research. And sometimes that gets flipped around the wrong way.

Where we're seeing real collaboration is around issues that are affecting broad swathes of industry, whether it's the water cluster that we have. There's a real good link there. Or now with our Connected Systems Institute bringing that technology all through the supply chain and right to the factory floor. Where the more practical it gets, the easier it is to engage.

MS. MERCHANT: Companies are engaging too.

MR. WEST: When I moved from a university here what I noticed was that universities, the timeline is months and years. Here it's days and months, and sometimes hours. So different timeline at universities.

Any other questions? Yes, in the very back.

MR. TODD: Hi, I'm Todd, I'm a high school student from Australia. You were talking --

MR. WEST: Thank you for coming out.

MR. TODD: Thank you for having me. You were talking a lot before about the coalition of different stakeholders in the manufacturing circuit coming together to work out this digital shift. I wanted to ask, how do you envision that coming about? And do you have any particular things in mind, like certain coalitions, sorry, not coalitions, like alliances or groups coming together to meet annually or quarterly to discuss that?

MR. WEST: But you know it is a long way to come from Australia. We are webcasting this.

MR. BRINKMAN: One example of that in Wisconsin is we have a Connected Systems Institute. And what we have there is the State of Wisconsin, the University of Wisconsin, Milwaukee, Rockwell Automation, and then several other entities that are all engaged around, you know, how can we take the research from the lab, how can we apply it practically to applications that are going to arise in the next few years. And then really make it affordable for manufacturers throughout the state and throughout the country.

But there has to be an alignment of purpose. Sometimes you don't get that. You know, the researcher wants one thing, the state wants something else, the company wants a third thing, and that's when it falls apart. Where it works really well is where you have that alignment, and getting that alignment can be really difficult, especially when you start talking about competitive companies or IP.

MR. BROUSELL: I could add a little bit to that. I mean I think there's a lot going on right now at the local level, state level, with the state organizations, the MEP organizations. At the NAM we have been doing, I think for seven years now, what we call Manufacturing Day. And last year in 2018 I think the number was, we engaged 3,000 manufacturing companies to open their doors to students, the community, legislators, all of the constituents to come in and see what a manufacturing company looks like.

So it's not one thing that we're going to be doing that's going to be able to move the needle here. We need to be doing lots of things. Lots of things are going on. We

need to do more of it, we need to make things like this new National Strategy for Advanced Manufacturing much better known than it is. Get discussion around it, get Congress to fund it, which is a really important part, and move forward on multiple fronts.

MR. WEST: Okay, we have time for one last question. Right here on the aisle.

FEMALE SPEAKER: Thank you again. I guess primarily to my neighbor from Wisconsin.

MR. WEST: Right, Wisconsin.

FEMALE SPEAKER: Right. At least with the paper industry historically the floor jobs in the manufacturing went to men, and they didn't go to immigrants, they didn't go to the Mung, and they didn't go to women. And if you had something where you had to check a criminal box, they didn't go to those people either.

So I'm wondering, since now in many areas there's actually a shortage of workers. Are you seeing any more flexibility on the immigrant, the female, the bandbox sort of employment impediments of the past?

MR. BRINKMAN: Tremendous. I mean it's whole constituencies that employers would never consider three or four years ago are now being considered. There's an extensive initiative through the state technical college system to work with soon-to-be released prisoners to gain new skills. They're being lapped up very quickly. You know we see initiatives going into particular communities. You mentioned the Mung community. You know, we've had manufacturers that have a direct pipeline in there because they understand how that piece of community works. They work hard. Sure, you have to do some things with language and culture, but now it's worth it.

I think our major opportunity right now, since we're sitting at such a low unemployment level, is that we have this opportunity to pull this whole class of people out of poverty and solidly into the middle class. But we have to use a little bit of ingenuity to do it. And I'm seeing some cracks, but I'd like to see a lot more.

MS. MERCHANT: When you have at diversity day and everyone brings potluck and you fly 42 flags within the company, you know that the immigration is in there. And like Johnny said, having English as a second language and the GED and the citizens, all of those classes, those are happening. And the fact that women work hard and now are often the sole breadwinners in their homes, that's pretty solid. They're amazing workers. Nobody's turning them away.

MR. WEST: Okay. We're out of time, but I want to thank Buckley, David and Cheryl for sharing their insights. And if you'd like to see our survey results, check it out at Brookings.Edu. Thank you very much for coming.

* * * * *

CERTIFICATE OF NOTARY PUBLIC

I, Carleton J. Anderson, III do hereby certify that the forgoing electronic file when originally transmitted was reduced to text at my direction; that said transcript is a true record of the proceedings therein referenced; that I am neither counsel for, related to, nor employed by any of the parties to the action in which these proceedings were taken; and, furthermore, that I am neither a relative or employee of any attorney or counsel employed by the parties hereto, nor financially or otherwise interested in the outcome of this action.

Carleton J. Anderson, III

(Signature and Seal on File)

Notary Public in and for the Commonwealth of Virginia

Commission No. 351998

Expires: November 30, 2020