TECHNOLOGY
SHEDDING LIGHT ON THE FUTURE
UGANDA
Bulambuli

DATA & TECHNOLOGY
SHEDDING LIGHT ON THE FUTURE

PROVIDER INTEGRATED PORTAL
Data opens the door to Kindergarten Readiness

WOMEN EMPOWERING WOMEN
Helping to close the gender gap from 8,000 miles apart
Women in Mississippi & East Africa Unite to Fight Issues Facing Girls & Women Worldwide

Creating the Portal to Kindergarten Readiness

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Editor-in-Chief: Laura McPhail
Managing Editor: Dominique Lewis
Contributors: Tori Boatner, Dominique Lewis, Laura McPhail, Annie Price, Mariah Stevens
Designer: Femi Sobayo

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Cowbell with spotlight on Drill Field Walk of Honor
(photo by Megan Bean / © Mississippi State University)
Women in Mississippi & East Africa Unite to Fight Issues Facing Girls & Women Worldwide

By Laura McPhail

The sun is still high in the afternoon sky when Agnes Mukoya takes a short break to talk about the new poultry co-op in her town, located in the Bulambuli district of Uganda, about 200 miles from the capital city of Kampala. The days are long and hot in July, and she is grateful for the opportunity to pause her housework and look after her six children, ranging in age from 4 months to 14 years old.

“We have had other NGOs come, which means working through bureaucracies, and when they run out of funds, they move on. This is different because they are working directly with people in the villages. It is more of a grassroots effort that reaches women who are not so educated and have very limited incomes,” Mukoya says. “The women learn skills to help themselves.”

Mukoya is referring to Women Empowering Women (WEW), an evolving research project led by Naomi Lumutenga, coordinator for Higher Education Resource Services, East Africa (HERS-EA), and Dr. Margaret Khaitsa, founder of HERS-EA and professor at the Mississippi State University (MSU) College of Veterinary Medicine. WEW was originally started to help improve school dropout rates for young girls due to lack of access to sanitary supplies and menstrual hygiene while improving business literacy for older women, and has now expanded into the poultry business.

What do MSU, an organization for women in higher education in East Africa, period poverty, and poultry farming have to do with each other? On the surface, it sounds like several disparate parts lumped together but, in fact, they are intricately connected. The answer is found in how research funding can lead
Finding a crack in the pipeline to higher education

At the center of these puzzle pieces that are 8,000 miles apart is Margaret Khaita, a professor and veterinarian specializing in zoonosis (diseases that travel between humans and animals). After 11 years at North Dakota State University, Khaita came to MSU in December 2013.

Through Khaita, MSU became one of six East African universities that were also part of the consortium.

“It was a $2 million grant, and that was my first time to manage a grant that big, and to manage people. I was like, ‘I need leadership skills’ and that is how I ended up at Denver,” Khaita said.

To help serve as a partnership director for such a large project, Khaita attended training offered by HERS at the University of Denver. When she was tasked to create a leadership project for the two-week course, she decided to focus on creating a HERS in East Africa that would serve women in higher education in seven countries.

“It was damm ambitious,” Lumutenga said of the undertaking. Khaita’s full-time university work prevented her from spending much time on the huge endeavor. When Lumutenga, who also lived in Uganda before relocating to the U.K., attended HERS training in Denver in 2014, she decided to pick up Khaita’s concept and create an action plan for HERS-EA to come to fruition.

After a couple of years of building resources and creating a curriculum, they started strategically planning how HERS-EA could become self-sufficient. As they continued to search for funding, Lumutenga discovered a study that showed school dropout rates in Uganda were higher for girls than boys of the same age group. The study revealed that one of the reasons girls were dropping out was the simple lack of access to sanitary pads.

“I was really heartbroken by this persistently high rate of girls dropping out. So we thought, ‘fine, while we’re looking for money to fund leadership for higher education women, let’s do something else,’” Lumutenga said. “After all, if the girls are dropping out at that rate, there won’t be enough coming through anywhere for higher education institutions, which is what the U.S. model is based on. But the U.S. model can assume that girls will come through the system. We cannot do that because the girls are missing. Eleven percent of their school time lost is directly attributed to lack of sanitary pads.”

Lumutenga started a pilot study that focused on a group of women who were making reusable sanitary pads as a pastime in her village in the Bulambuli district. She collected anecdotal information that was disturbing and eye-opening.

“I have recordings of the stories the women were telling. It blows you away,” she reflected. “Women were talking about how they find a reason not to go to bed when they’re menstruating because they are fearful of soilng the bed. Women had been humiliated by their husbands. One man had displayed the beddings outside their house to shame his wife, and then threw her out.”

One of the things we discovered during our pilot that really shocked me was while we were looking at girls missing school, we came across 40% of female teachers also missing school because they couldn’t afford sanitary supplies,” Lumutenga said. “And if a teacher cannot afford sanitary pads, there’s no hope for a rural woman who has no income. So it’s relative. It’s ‘do I buy food or do I buy sanitary pads?’ That’s not a fair choice for anyone to be faced with.”

Research also shows that family demands such as domestic and farming chores, early pregnancies, early marriages, and gender-based violence were factors in girls dropping out of school. As a result, it becomes a near certainty that they will have lower incomes, larger families, and totally domestic activities for the rest of their lives.

Seeing evidence of a serious problem that had cascading effects for girls and women who were once destined for higher education, Lumutenga and Khaita decided to build a group dedicated to making reusable sanitary pads.

“That’s about the time when we were invited to come to a leadership conference at Auburn University by the Tuskegee University project. Women Leadership, Lumutenga said.

The women traveled to Auburn, Alabama, on behalf of HERS-EA and presented their findings from the pilot study. They were met with an enthusiastic crowd, who took up an impromptu collection of about $400 and asked that it go toward helping the sanitary pad project.

She smiles at the memory of the generosity shown that day. “I said, ‘Well, that’s two sewing machines, 400 pregnant women. That’s a lot of sanitary pads,'” Lumutenga said.
Dr. Caroline Kobia works with women to sew textiles to create sanitary pads for African girls and women.

Beatrice Khaitsa dropped out of school, got married at 17, and had 5 children. For the first time in my 16 years of marriage, we work together as a family. For the first time, I was able to bring home groceries and plan my future. Now I talk to other women and encourage them to learn from me about chicken farming.

and that will get the women going. And that’s how we got going!” Lumutenga remembered.

Launching a research project

Armed with $400 and a fierce sense of purpose, Lumutenga and Khaitsa formulated a plan for creating a project with two objectives: (1) organize a group of people who can make reusable sanitary pads to help fill the supply gap for girls in school and (2) teach basic business skills to the group that would help make the initiative self-sustaining and scalable.

They had a group of people in Bulambuli who knew how to make sanitary pads, but had absolutely no idea how to run a business. They also had a group in Khaitsa’s home district of Butaleja who knew basic business skills from a recently abandoned project conducted by World Vision, but didn’t know how to make sanitary pads. The obvious answer was to get the two groups together for cross-training, but it would definitely take more than $400 to get it going.

This is where the MSU piece of the puzzle comes into the story more directly. Khaitsa had been working with the MSU International Center for a couple of years to lead study abroad veterinary courses in Uganda. She went to the center with a proposal for interdisciplinary research based around their new sanitary pads project, and was granted $4,000 to help get it off the ground.

This was Phase I. From $4,400, the HERS-EA team purchased four regular sewing machines and one special machine for edging for the two groups. They bought fabric and arranged transportation for the Butaleja group to get to Bulambuli. Though the districts are only about 60 miles apart, this was no easy feat considering it takes days to travel short distances due to the lack of road infrastructure in Uganda. They also secured a group of rural outreach tutors from Makerere University to facilitate the business portion of the training. Then, they traveled back to MSU to report their activities and gain useful feedback.

“It’s a project that lends itself to a lot of interdisciplinary research. I was amazed how colleagues came to share after the first $4,000 we got from the International Institute. That’s when Leslie had just been hired here and then she came on board immediately,” Khaitsa said, referring to Leslie Hossfeld, who was the head of the sociology department at that time.

Picking up the pace

Seeking to keep the momentum growing, the women met with Mimmo Parisi, founder and, at that time, executive director of the National Strategic Planning and Analysis Research Center (NSPARC).

“He said, if that is what you can do with $4,000, here is $10,000,” Lumutenga said. “He said, ‘What I want back is what did you do with it? What are the outputs? What’s the way forward?’ So that was Phase II.”

Now with the means to accomplish dual purposes, the HERS-EA representatives put $2,500 toward more sewing machines, fabrics, and training and registering the companies as legal entities. Then, they applied $2,500 toward airfare for representatives from Ethiopia, Kenya, and Burundi to attend a one-day conference to create curriculum for the first ever HERS-EA Academy, which was being planned for later that year. The remaining $5,000 was spent on two professors from the MSU Department of Sociology traveling to Uganda and attending the Academy.

The outpouring of support for the Academy was overwhelming. When universities in the seven-country region were contacted about sending women in higher education to the week-long HERS-EA leadership course, they were met with enthusiastic responses. Twenty women agreed to provide leadership skills training for the first Academy at no cost to HERS-EA. By waiving tuition fees, HERS-
EA gathered 52 women together for the first Academy, where the only female supreme court judge on the African continent gave the keynote address.

At the end of Phase II, the women published an article in the Journal of Community Engagement and Scholarship titled “Women Empowering Women Through Reusable Sanitary Pads” to present their research findings from the pilot study to the world. They presented this article, along with breakdowns of their spending, anecdotal evidence, survey responses, and other evidence of their work to Parisi, who immediately approved $50,000 funding for the ambitious Phase III of the project.

**Overcoming barriers**

Phase III focused on increased training and an alternative education model for the women in the pilot. There were many barriers to this venture becoming a true business, not the least of which was language and literacy.

“Uganda is about twice the size of Mississippi, but it’s got 23 different languages. So if you travel 50 miles, you will not be understood by the person you’re talking to, unless you’ve all gone to school and you speak English,” Lumutenga explained. “And we have to address literacy, at least in the groups we’re operating with, in order for them to operate. Literacy is a matter of life and death in developing countries.”

She goes on to describe the alternative education model. The women are taught literacy tailored to the work they were doing and numeracy for their bookkeeping. Once they learned numeracy, they could use the transferable skill in any setting.

“Two times three will always be six, whether you learned it through your business or on a whiteboard at school. But they’re too old for whiteboards at school and are intimidated by it, so we have created an environment that is safe,” she continued.

The team from Makerere University created a multiple entry, multiple exit model.

“You can come in at whatever level you dropped out, and you can go out and look after your babies and come back again when you’re ready,” said Lumutenga. Building from what they learned in the sanitary pad project, the women were taught numeracy for six months, and then business skills for another six months. By the time they graduated, they were expected to have a profitable business. “At the end of 12 months, these women will be running profitable poultry businesses, and the market is there. It is fast.”

While the women are training for the poultry business, the work of providing reusable sanitary pads continues. Caroline Kobia, an assistant professor of fashion design and merchandising from the MSU School of Human Sciences, joined the HERS-EA team in 2018 to assist with developing a more competitive product. Girls in local villages were reluctant to purchase the pads because the packaging was unattractive and called attention to their need for a product they associated with poverty. Women and girls have also reported using pieces of old blankets and even dry leaves in lieu of sanitary pads, thus exacerbating the problem to include health issues.

Kobia, who is originally from Kenya, says the project “just makes sense.” She specializes in social entrepreneurship and wants to help women create a product that comes with ownership of the process and sustainable income from the effort.

“I want to help them by using a triple bottom line model that focuses on people, planet, and profit,” Kobia said. “It’s something the people need, we can find sustainable and biodegradable local materials for the textiles that make the pads, and these improvements can lead to profits for these women.”

Another barrier Lumutenga makes note of is the lack of administrative capacity for HERS-EA. Currently, they have one desk in a shared office in Makerere University. She says a goal is to get an office of their own, independent of the university. They have one volunteer administrator who holds down the fort while Lumutenga travels. She also cites the need for quantitative data. “You can’t even raise the issue of policy without data. We need funding for our research. We need hard data to show that going without access to sanitary pads and having to use the unhygienic alternatives is harmful to women,” Lumutenga said. “That’s why we need women to research. We’re trying to get together a cohort of women researchers to bring out hard scientific data from all those issues.”

**Getting women to the table**

In a patriarchal society, not having women represented at the table is the crux of the problem.

“The African woman is the backbone of life itself. The African woman provides food for the family. She’s the one that puts her child to bed hungry. She’s the one that takes the child to the hospital. It’s never the father,” Lumutenga explains. “The African woman is the washing machine. The African woman is the washing machine. The African woman is the tap that provides water, is the vacuum cleaner, is the cooking fuel carrier, is the plow. And yet, that is the person that is missing at the table where decisions are made. Any decision-making table that doesn’t have a woman…that decision is not going to work.”

One of the most important advances HERS-EA is making through the WEV project and...
their annual leadership Academy is that some strides have been made in educating men about issues facing women in Uganda. In a society where the mere mention of menstruation is taboo for men, this is an important step.

“Politicsicians, who are predominantly men, are finally talking about providing sanitary pads in schools. But when the budget gets tight, the first item to drop off the list is sanitary pads—unless the school is headed by a woman,” Lumutenga expounds. “And that’s why you will find in our four-tier model that we’re looking at getting women to head institutions.”

However, she is quick to point out that negative attitudes about women don’t just originate with men. She asserts that women need to advocate for themselves and start putting their own needs as a priority. She relates a story about a session at the first Academy in summer of 2019 and remarked on the visible changes in demeanor among the women in attendance throughout the week.

“You could see the women feeling more empowered as the week went on,” Jordan said. “That’s one of the objectives: to build confidence so the women can feel more empowered and to take ownership of their careers.”

Research in action
Since HERS-EA was formally established, they have now finished four phases of the pilot project that was first proposed in 2016. NSPARC completed its promised funding of Phases II – IV in 2019, for a cumulative $110,000. While this is no small amount, it is not huge in the larger grand-funding world, which makes the outcomes from the project even more amazing.

Phase IV outcomes are still being tabulated and a formal report is forthcoming, but initial results are positive. A colleague from Makerere is still working with and evaluating the poultry co-ops and has now introduced rabbits as another business source, which diversifies the co-op’s offerings to the community and skills for the workers.

Mukoya, the poultry co-op worker from Bulambuli, says life has changed for her and the people in her village. Though she has a business degree, she works with a team of 42 at the co-op as a means to make extra money while taking care of her children and domestic responsibilities.

“The extra income is a huge benefit because it helps to pay for school fees [for her children],” Mukoya said. “Most of the workers at the co-op are farmers without crops. Sometimes the crops can flood or just fail, and we can still earn income by working at the co-op.”

“It’s also nice to be able to take our work indoors,” she notes with a genuine smile while the sun is shining down brightly on her face.

Educators from MSU have also gained an appreciation for the impact of this kind of research in action. In fact, the challenges facing women regarding access to basic sanitary supplies is not limited to developing countries.

According to period.org, “It’s 2019, and yet, 35 U.S. states still have a sales tax on period products, considering them non-essential items. One in four women struggle to afford period products due to a lack of income. In the first citywide study on period poverty, it was found that 46% of low-income women had to choose between a meal and period products.”

Researchers from MSU hope to apply some of the lessons learned in Uganda to girls and women facing period poverty in similar rural areas like those found in Mississippi.

“I have learned so much,” Kobia said enthusiastically. “In a nutshell, it is incredible to see how eager the women are and the impact projects like this make on individuals, families, and communities at large. Also, for successful community-engagement projects, the power of network connections and collaborations cannot be overemphasized!”

Jordan agrees and hopes to expand MSU’s research foothold in Uganda to other academic areas.

“From an institutional perspective, it was a place I needed to visit so I could see for myself what kinds of relationships were there...and find other ways to bring other colleges and departments to the table for work aside from what is already being done,” Jordan said.

HERS-EA is still seeking stable sources of funding now that the funding period from NSPARC has ended. Khaitsa lists five objectives for the next five years: (1) to secure funding for the Academy, (2) to establish operational pieces in other East African countries, particularly in Ethiopia and Tanzania, (3) to bring Rwanda onboard, (4) to start peer-reviewed journals and teach scientific writing in the Academy, and (5) to start a paid membership program.

If you would like to learn more about HERS-EA and the WEW project, please visit the MSU International Center or hers-ea.org.
Imagine the structure of Mississippi’s early childhood care and education system as a house. It provides a safe environment for the occupants, the kitchen is stocked with staples for a nutritious diet, there is a playroom with fun activities that encourage creativity and imagination, and there is a backyard for physical activity. The caretakers of this house are specially trained to not only maintain and upkeep this stimulating setting, but to also provide educational programming throughout the day that is motivational and engaging.

**But what if there was no door to this house?**

This was the problem in 2017 when the Mississippi Department of Human Services (MDHS) came to NSPARC in search of a way to collect information from the more than 1,100 private child care facilities in Mississippi. The lack of a unified system to integrate provider practices and quality standards posed a large hurdle for MDHS and caregivers across the state. To facilitate change and raise the quality standards for early childhood care and learning, NSPARC partnered with MDHS to create the Provider Integrated Portal (PIP).

**Building a strong foundation**

PIP is an online portal that was created to help Mississippi early childhood care and learning providers who participate in the Child Care Payment Program (CCPP), which provides vouchers for subsidized child care for low-income families, to apply for the “Standard” designation.

“The challenge on this project has been that there was no prior vetting process for the providers to receive vouchers and funding,” said Ananth Ramchandran, software architect at NSPARC.

“So PIP is a system that was developed through an iterative process.”

If PIP is the door to the house, then the Standard designation is the foundation. It is the first milestone that providers must achieve to demonstrate their centers have met the State of Mississippi’s standards of prioritizing the physical health, mental health, nutrition, and learning of young children by raising the quality of early care, learning, and family support. The Standard application consists of four major sections: (1) licensing information; (2) professional development with a focus on health and safety training; (3) curriculum information; and (4) self-assessment.

As with any complex enterprise software project, NSPARC Associate Director for Design and Development Jonathan Barlow started with determining what features MDHS was hoping such a system could have. He then worked from there with his team of developers to create the portal. Thus, PIP—the door in this metaphor—was created. PIP facilitates the application of the new high-quality framework for all child care providers, so parents can expect the same quality of care from all facilities—no matter the region, socioeconomic status, or demographics of the centers.

But what if the doorway to this amazing house was too narrow to bring in resources from the neighborhood and community into the house, making it too narrow to allow for repairs, maintenance, replenishments, and improvements?

**Portal to success**

An early version of PIP allowed almost 1,100 private child care centers to receive the Standard designation through a pass or fail evaluation of the applications provided through the portal. This worked for the initial needs presented by MDHS, but it became obvious that improvements were necessary.

“I came to NSPARC and was assigned to this project about the same time that MDHS asked for new features. We had a good phase one system, but it was time to move on to the next phase,” NSPARC Business Analyst Rosanna Otondo said.
“We assembled a team again to gather and analyze user requirements, which is basically asking ‘How can we improve the current system?’” explained Otondo. “As the original software architect, Ananth had the historical knowledge of the phase one build, and Ben Holley joined as one of the lead programmers. Megan Campbell, Katerina Sergi, and Mallory Hancock contributed with their early childhood knowledge. Hal Teasler was the user interface designer, and I was the business analyst for the project. We approached it holistically, as a team, and we went through several iterations as we discussed with the MDHS.”

NSPARC’s development team performed a total rewrite of the program in the spring of 2019 to alter the wording of some questions for easier comprehension, add a few options to elaborate on the answers, and create a smoother operation.

PIP now provides an all-inclusive portal for every branch of child care. It serves the child care providers, early childhood coaches, curriculum reviewers, MDHS staff, and CCDF administrators. Child care providers can log in and submit an application. If the application is approved, the facility will receive a Standard designation for meeting minimum quality expectations, which then allows the center to accept vouchers from the families receiving the CCPP assistance. “I think the most important improvement we made to PIP is adding the functionality for curriculum review. This was not present in the first iteration,” Otondo said.

Early childhood coaches from the Early Childhood Academies (ECAs), managed by the Mississippi Community College Board (MCCB), can log in to help providers submit their applications, and they also offer various types of training. Curriculum reviewers—specialized reviewers who screen the curriculum portion of the providers’ application—will either approve it or send it back for corrections and provide feedback on why the responses need more work. The feedback section was standardized with dropdown lists of reasons for corrections that the reviewers can choose from, making it fair and equitable to all providers. “This way, an action plan can be developed between the ECA coaches and the provider,” Otondo said.

The MDHS staff and supervisors screen the other sections of the application to meet the requirements of the Standard designation. This helps make PIP a group effort to improve overall quality of child care, rather than a pass/fail test.

The restructured system was tested among 10 pilot child care providers statewide, and feedback was sent to the NSPARC development team. First Baptist Church Longview Child Development Center was part of the pilot group, and director Sara Hathorn was contacted to begin the PIP application. Hathorn considered the questions straightforward, but detailed. “PIP was fairly easy to navigate during the application process. I was able to complete the online application process within a few hours. PIP gives providers a benchmark to go by as well as a standard to strive to achieve if mastery in some of the objectives has not been attained by any particular child care center,” Hathorn said. “PIP serves as a one stop for providers needing to verify and update staffing.”

NSPARC’s early childhood programmatic team echoes Hathorn’s assessment by referring to PIP as “a seamless online management and referral tool that is transparent, efficient, and equal for all stakeholders.”

Continuous quality improvement

What about centers without computers or internet connectivity? MCCB is responsible for managing 14 ECAs which are comprised of technical assistance specialists, business advisors, and resource and referral specialists to provide comprehensive services to providers and families. The ECAs send their coaches, outfitted with computers and Wi-Fi hotspots, to the centers in network deserts to help staff complete the applications.

Child care providers (directors, assistant directors, and classroom caregivers) can use PIP to gain...
access to trainings taught by the ECA coaches. These trainings aim to implement continuous quality improvement, which is a requirement for providers to achieve the next level: the Comprehensive designation.

If the Standard designation is the foundation of our early childhood care and education “house,” then imagine the Comprehensive designation as the lightning-fast, unlimited fiber Wi-Fi connection in every room that makes this house a model for the 21st century. The Comprehensive designation represents the pinnacle of quality for child care facilities in the state. To achieve Comprehensive status, the child care center must showcase a multitude of improvements in 10 goal areas, including education, administration, assessments, and services. Additionally, to receive the Comprehensive designation, providers must display a continuity of quality in the progression of a child’s care and learning.

Current expansion efforts for the State Early Childhood Advisory Council’s (SECAC) early childhood plan, funded by the Preschool Development Grant Birth Through Five (commonly referred to as “PDG B-5”), include the implementation of the Comprehensive designation pilot program and the integration of Head Start into PIP.

Future plans for PIP
The short-term goal is for every child care center in the state to achieve a Standard designation by September 30, 2019, effectively creating a baseline of high quality. According to MDHS Chief Counsel for Programs Andrea Sanders, the agency will continue to provide support through the ECAs to help all providers achieve a Standard designation and assist those who wish to pursue a Comprehensive designation.

According to NSPARC Deputy Executive Director Mike Taquino, projected updates for PIP in the months and years to come will include a parent portal, which will allow parents to see and contribute to electronic assessments for each child. When the child moves to a different center or goes to Kindergarten, PIP will make that scorecard easily accessible to each center and school.

Mississippi’s early childhood education and learning “house” is undergoing major renovations to make it the best environment possible for children to grow into accomplished adults. PIP opens the door for multiple agencies to create a holistic and detailed approach that gives each child in Mississippi the care and education they need for long-term success.
WHAT IS A CYBERNETIC CITY?

Ask 10 data scientists this question, and there will more than likely be 10 diverse answers as the scientific community strives to define the evolution of smart cities into more complex systems. This relatively new term will be the overall focus at Data Summit 2019 as attendees explore the theme, “Cybernetic City: An Ecosystem for Big, Smart, and Fast Data Economies.”

Hosted by Mississippi State University’s National Strategic Planning and Analysis Research Center (NSPARC), the summit will be held on Sept. 12 and 13 at The Mill Conference Center in Starkville, Mississippi. During the two-day conference, scientists, industry experts, academic practitioners, and lawmakers will connect and explore the cybernetic concept.

During a presentation at Sapienza University of Rome in September 2018, NSPARC founder Mimmo Parisi asserted that cities are moving toward datatization, connecting datafied processes that produce goods and services in smart ways. This is the foundation for cybernetic cities, the existence of which is enabled by infrastructure, governance, public policy, management, workforce, and scientific expertise.

Whether a business or organization in a cybernetic city is a public or private institution, the common denominators are big, smart, and fast data. Rapid evolution of smart cities into cybernetic cities and the growth of the field of data science itself has also resulted in the evolution of Data Summit. The annual conference was originally created as a vehicle for political leaders to discover how data science can help bring meaningful change to legislation. Now, the summit’s scope has been expanded beyond this aim.

“We are very proud of how Data Summit has grown substantially in just four years,” said NSPARC Deputy Executive Director Steve Grice. “We started out in 2016 with a gathering of legislators to discuss how data science can help inform decision-making. Since then, we have evolved this event by providing an intersection between professionals in academia, government affairs, and industries such as energy and sports. Though they may seem disparate, they all benefit from the use of data science, and it is important to have all of those different perspectives present at the discussion table.”

According to NSPARC Communication Manager Laura McPhail, each of the breakout sessions at Data Summit will reflect how data science provides value to each of the aforementioned sectors.

“The breakout sessions will hit a variety of aspects,” McPhail said. “There is a lot of data science research being done in different areas of interest, and
we want to talk about how to put that research into practice.”

The featured panel, How Data and Technology Are Shaping the Workforce of the Future, will deliver a discussion among national experts on how vast amounts of data and emerging technologies are accelerating workplace changes and what workers and employers can do to prepare for those changes. One of the panel speakers, Desmond Dickerson, manager of the Cognizant Center for the Future of Work, explains that factors such as artificial intelligence, communication technology, and people analytics in the workplace will cause jobs to either be enhanced, created, or eliminated (see page 26).

Data science is rapidly making its way into all sectors of the workforce, and within the next 10 years, members of the workforce will be actively working in roles that have not been created yet. The next question arises: how do we prepare students for future careers?

Participating on the Technology Education Today for the Workforce of Tomorrow panel, Allen Parrish, associate vice president for research and professor of computer science and engineering at MSU, will discuss how education will evolve to prepare students for future careers in data science.

“We need data science degree programs,” Parrish said. “But we also need to do a better job of teaching computational thinking and a data-oriented worldview in all degree programs.”

Parrish explains that in order to create data science degree programs to better prepare students for future work in the data science field, it is vital to first discover the fundamentals of the discipline. This would require bringing people together from a variety of disciplines—computing, engineering, math, business, social science, agriculture, and just about any other discipline where data is influential. Educators will have to figure out how to constructively mesh these disciplines together to help prepare students. Over time, as pedagogy matures, people will become more adaptable to a larger variety of data-centric jobs.

Along with education, manufacturing is now becoming a new hot spot for data science because machine learning and artificial intelligence are playing much bigger roles within the manufacturing industry.

“Data science is a particularly disruptive force in the manufacturing sector,” McPhail said. “People who have felt very secure in those [manufacturing] jobs because they’re very skilled and perhaps they’ve been doing it for a long time, realize that there’s maybe a machine coming that can do their job. Suddenly, the company doesn’t need a person standing there doing that job because a person can introduce human error into the equation, but a machine doesn’t. So how does that person evolve into a new job or obtain a new skillset where they are now managing the machine instead of performing the work themselves?”

Chad Green, president and founder of Lantern, LLC, will address changes in the manufacturing sector with his presentation, Deploying AI Models in Everyday Devices to Bring Disruptive Products to Market. Machine learning is not a new technique for solving problems. It has been around for decades, but Green explains that the recent release of open-source tools and libraries significantly reduces the barrier to entry for new researchers and developers to get started.

“As a result, we’re seeing many applications of machine learning in places we never would have expected it,” Green said. “Applications for improving safety are evident in devices like the Apple Watch, developed with

“Data science will continue to make measurement, evaluation, and forecasting much easier with more accurate results.”

–Chad Green
multibillion-dollar engineering budgets, but now tinkerers and hobbyists can have access to the tools as well, leveraging human creativity in all of its variants, to solve real-world problems."

One such application that Lantern is currently working on detects hazardous motion in power tools. “Data science will continue to make measurement, evaluation, and forecasting much easier with more accurate results,” Green explained. “But the burden is still on us humans to make sure that garbage doesn’t find its way into the system. Most data scientists call themselves data janitors for this reason. As far as the future is concerned, the manufacturing industry will be revolutionized.”

According to the Institute for the Future in Palo Alto, California, “Over the next decade, we will see an acceleration of the pace of cybernetic upgrades to the planet’s industrial-era infrastructure, as automation, locomotion, and intelligence are embedded in urban networks and structures for transportation, energy, and service delivery.” This is a key theme in two breakout sessions, one regarding data for community resilience during disasters and one covering the role of data in the energy sector.

Mike Mazzola, executive director of the Energy Production and Infrastructure Center (EPIC) at the University of North Carolina, is one of the speakers on the Transforming the Global Energy Economy with Data panel. Mazzola points out how data science and the global energy economy go hand-in-hand.

“Over the next decade, we will see an acceleration of the pace of cybernetic upgrades to the planet’s industrial-era infrastructure.”

-Mike Mazzola

“Data is already critical to running the global energy economy efficiently and safely,” Mazzola said. “In my presentation, I will discuss a fascinating example derived from what the electrical energy generation and delivery industry learned from the 2017 total eclipse of the sun.”

Mazzola foresees data helping to aid transportation of mass amounts of people in a cybernetic city.

“Two developments that are hard to handicap will ultimately decide this question,” Mazzola said. “Is the future still dominated by automobiles as it is today? Or, will urbanization continue to the point that automobiles will be in decline because fewer and fewer individuals will need or want them? Entire industries will rise or fall with the answer to this question, and data will be crucial to figuring it out at both the strategic and tactical levels.”

Information regarding registration, schedule, and speakers can be found at datasummit.info.

Other Data Summit 2019 topics include:

- Bots and Deepfakes as Influencers in the Social Media Landscape
- The Quantum Day of Reckoning: When Quantum Computing Will Break Most Crypto and What You Can Do to Prepare
- Bringing Intelligent Security to Big Data
- Wearable Sensors in Athletics: The Data Ecosystem in Sports
- Integrated Data for Community Resilience
- Great for Business: How Data Prove Workers with Disabilities Help Companies Thrive

As trends continue to evolve in data science research, Data Summit continues to evolve as well. This year’s Data Summit will host a variety of data-driven conversations, and is sure to be the most inclusive summit yet.
Connect with hundreds of colleagues across multiple sectors, along with dozens of top leaders and decision makers who will speak about concepts, considerations, and innovations in the data economy at Data Summit 2019.

September 12-13, 2019

The Mill Conference Center
100 Mercantile Street • Starkville, MS 39759

For details and registration, visit datasummit.info

How Data and Technology Are Shaping THE WORKFORCE OF THE FUTURE

As workplace changes are accelerating due to data and emerging technologies, a panel of top-notch national experts help you understand what this all means for the workforce of tomorrow and how to prepare today.

**PANELISTS**

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<thead>
<tr>
<th>Topic</th>
<th>Panelists</th>
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<tbody>
<tr>
<td>How Data and Technology Are Shaping the Workforce of the Future</td>
<td>Scott Waller, President &amp; CEO, Mississippi Economic Council&lt;br&gt;Janice Zdankus, Vice President, Hewlett Packard Enterprise, Customer Experience and Quality&lt;br&gt;Craig Sparks, Chief Innovation Officer, C Spire&lt;br&gt;Desmond Dickerson, Manager, Cognizant’s Center for the Future of Work&lt;br&gt;Josh Sawyer, Senior Director, Microsoft, Education Strategy</td>
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**Thursday September 12**

<table>
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<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>12:30 – 1:30</td>
<td>Check-in</td>
</tr>
<tr>
<td>1:00 – 1:30</td>
<td>Juried Poster Symposium&lt;br&gt;Data Tech Petting Zoo</td>
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<tr>
<td>1:30 – 2:00</td>
<td>Welcome and Conference Opening</td>
</tr>
<tr>
<td>2:00 – 2:15</td>
<td>Break</td>
</tr>
<tr>
<td>2:15 – 3:30</td>
<td>Breakout Sessions I&lt;br&gt;Technology Education Today for the Workforce of Tomorrow&lt;br&gt;Bots and Deepfakes as Influencers in the Social Media Landscape&lt;br&gt;The Quantum Day of Reckoning: When Quantum Computing Will Break Most Crypto and What You Can Do to Prepare</td>
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<tr>
<td>3:30 – 3:45</td>
<td>Break</td>
</tr>
<tr>
<td>3:45 – 5:00</td>
<td>Breakout Sessions II&lt;br&gt;Transforming the Global Energy Economy with Data&lt;br&gt;Bringing Intelligent Security to Big Data&lt;br&gt;Deploying Machine Learning in Common Devices to Bring Disruptive Products to Market</td>
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<tr>
<td>5:00 – 7:30</td>
<td>Reception</td>
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**Friday September 13**

<table>
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<td>Registration and Breakfast</td>
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<tr>
<td>8:00 – 8:45</td>
<td>Welcome and Morning Keynote</td>
</tr>
<tr>
<td>9:00 – 10:30</td>
<td>Panel: How Data and Technology Are Shaping the Workforce of the Future</td>
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<tr>
<td>10:30 – 10:45</td>
<td>Break</td>
</tr>
<tr>
<td>10:45 – 12:00</td>
<td>Breakout Sessions III&lt;br&gt;Wearable Sensors in Athletics: The Data Ecosystem in Sports&lt;br&gt;Integrated Data for Community Resilience&lt;br&gt;23 and Criminality: The Unintentional By-Product of Genetic Genealogy&lt;br&gt;Great for Business: How Data Prove Workers with Disabilities Help Companies Thrive</td>
</tr>
<tr>
<td>12:15 – 1:45</td>
<td>Lunch and Keynote</td>
</tr>
<tr>
<td>1:45 – 2:00</td>
<td>Closing</td>
</tr>
</tbody>
</table>

**KEYNOTE SPEAKERS**

- **MODERATOR** Sid Salter<br>Director, Office of Public Affairs<br>Mississippi State University

- **Tony Sager**<br>Center for Internet Security

- **Kristin Judge**<br>Cybercrime Support Network
Whether a person is visiting a doctor who uses a computer during a checkup or scanning groceries at self-checkout kiosks in a retail store, data and technology are becoming more and more prevalent in daily life and are being integrated in aspects of every industry. The workforce is starting to feel the effects of this widespread change. This topic will be front and center in the main panel titled How Data and Technology Are Shaping the Workforce of the Future at the 2019 Data Summit (see page 18). Data and technology are now prompting companies to implement changes in the workplace by introducing artificial intelligence and streamlining work processes. As a result, automation is replacing a large number of jobs, leading many people to wonder if data and technology will completely change the face of the future workforce.

According to Anthony P. Carnevale, research professor and director of Georgetown University Center on Education and the Workforce, manufacturing, once at the forefront of the labor market, has been on a decline since the 70s and 80s due to a shift from a manufacturing economy to a services economy. In recent years, the increased ability to handle large amounts of data with computer-based technology has created an economy that is now driven by information. Employers within the manufacturing industry have been adjusting to this shift by upskilling their existing workers and revamping training and recruiting programs. Companies are now adjusting job requirements by accepting workers who possess some form of postsecondary education to fill the increasing need for more qualified workers. So what do all these changes mean for the future of work?

Desmond Dickerson, manager of Cognizant Center for the Future of Work, provides some insight. “The future of work will in a lot of ways look like today, then there will be some elements of it that will be completely unrecognizable.” Based on Dickerson’s research with Cognizant, the agency is predicting that 75% of jobs will be enhanced, 13% net new jobs will be created that haven’t been considered yet, and 12% of jobs are going to be eliminated.

Automation to Enhance or Eliminate Jobs
Dickerson indicates that most jobs are going to stick around, but will be enhanced through artificial intelligence, automation, and other computerized tools. These technologies will make jobs more efficient and easier to do.

“These are jobs that previously took lots of man hours to do. Entry-level attorneys previously took two weeks to read through contracts and sort through data/information. Now, we’ve got algorithms and machine learning programs that can do that in two hours or less,” Dickerson said.

As jobs are steadily being enhanced through new technology, many menial manual jobs will be completely automated. Carnevale explains that these...
eliminated jobs are the dangerous or repetitive jobs that no one wants to do. For example, a coal miner is unlikely to use a pickaxe as there is a now a machine available to perform that task.

“Every time we lose a manual job, we add a higher technology job that probably pays more, so we need to think about automation as not necessarily replacing workers. It is replacing some type of worker, but it also creates a new worker that’s going to make more money,” Scott Alsobrooks, president of East Mississippi Community College said. “However, it’s going to take higher skills for these workers to calibrate, program, and maintain these robots.”

For the workers who will lose their jobs due to automation, Carnevale suggests that they upgrade their skills or enter a different field to thrive in the future workforce. Experts agree that data and technology will not wipe out the workforce of the future. “Artificial intelligence allows us to do so much more data processing, almost instantaneously...coming up with solutions or finding patterns that we previously could not identify. However, the human factor is still needed,” Dickerson said. “While AI does some analysis for us and can help us to analyze large amounts of data at one time, the interpretation and taking action based on that data and analysis, those are the skills that people can really lean on to continue to have opportunities moving forward in the future of work.”

Due to job enhancement and an increasing number of older workers retiring, manufacturers are in great need of highly skilled workers to fill these mass job openings. As a result, companies are now placing a high value on short-term training and certifications to recruit qualified workers to assume these roles. Carnevale points out, based on the specific field, manufacturing jobs and many trade jobs could pay more than what a person who possesses a bachelor’s degree or even a master’s degree might earn.

This shift is causing a large number of high school graduates to forego seeking a four-year degree to enter a one- to two-year training program.

The Communiversity
Community colleges and other institutions are improving curriculum to efficiently train students for trade jobs and advanced jobs in manufacturing as well as other industries where technology is vital. EMCC recently opened the Communiversity, a $45 million career-technical facility in Columbus, Mississippi, specifically designed to prepare students to work in high-tech industries.

“The concept of the Communiversity was created to build a workforce for the advanced manufacturers that have been brought to the region such as PACCAR, Yokohama, Aurora, and Stark Aerospace,” Alsobrooks explained. “You need that pipeline of skilled workers, and the labor market has changed in such a way where there no longer is the requirement for everyone to have a four-year degree. There is a large bulk of jobs in Mississippi that only require a two-year degree.”

Programs that are offered at the Communiversity include Electrical Technology; Mechatronics Technology; Engineering Drafting and Design; Precision Machining and Manufacturing; Systems-based Automation; and Industrial Maintenance.

These programs will ensure students are prepared for current openings and new jobs that will soon come to the area. Alsobrooks says that many local business leaders will also train their existing staff at the Communiversity.

Data and Technology Create New Jobs
According to Cognizant, the 13% of net new jobs that will be created are the jobs that don’t exist yet and haven’t even been thought of as emerging technologies continue to
Dickerson provides the Social Media Manager role as an example.

“Fifteen years ago, if someone said ‘let’s bring in a social media manager,’ no one would have had a clue what that meant. Now the role is a key element in marketing. New roles like that are what we will see,” Dickerson said.

Since new jobs will be created in the future, what skillsets should the members of the workforce possess to operate new technology and perform well in a new or enhanced job?

“Some people may think that the workforce will change significantly in the next 10 years, but it is slow moving. Over a ten-year period, job set skills don’t change as much as people think,” Carnevale explained.

“About 80% of the change in skill requirements over any reasonable period of time, generally 10 or 15 years, occurs inside the occupation. Every job is a set of tasks and activities that people do and what will change is those tasks and activities.

It takes a long time to kill off an occupation where all those tasks and activities are eliminated.”

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her team have been working to include more computer science content and courses in the K-12 educational curriculum.

“Our CS4MS initiative is about getting computer science and computational thinking skills into all public schools in Mississippi from grades K-12. They will have opportunities at every grade level to be exposed to computer science through coding, robotics, and some web design and app development. We are also looking to introduce the idea of data and data science,” Hollis said.

The State of Mississippi has approved K-12 computer science standards in not only standalone courses, but also integrated strains of computer science in other classes such as math, English, and science. Teachers are also being trained to integrate technology content in many districts, and Hollis and her team are visiting underserved districts.

In relation to youth workforce training, Alsobrooks is looking to attract the attention of high school and middle school students with the Communiversity’s Imagination Center, a showroom featuring displays of various occupations, tech devices, and products created by top employers in the region. He explains, “Students don’t have to be 18 to come to the Communiversity. Students can come for dual credit if they get approval from their high school. We’re trying to get them trained as early as we can.”

Looking Forward

As data and technology continue to shape the workforce of the future, it is important for members of the workforce to also utilize data and technology to continually gain knowledge and acquire new skills.

“What we think will happen moving forward is that there will be a push to a lifelong learning model,” Dickerson said. “What’s going to be increasingly important is seeking smaller micro degrees or micro-learning opportunities where you can pivot. You can continue to learn new things as you advance in your career.”

By adapting to change, acquiring new skills, and embracing data and technology, the workforce of the future is set to have more opportunities for learning, advancement, and increased earning potential.

Data Summit 2019
September 13, 2019

Main Panel: “How Data and Technology Are Shaping the Workforce of the Future”

Panel of national experts will include:
Josh Sawyer of Microsoft
Janice Zdankus of Hewlett Packard Enterprises
Craig Sparks of C Spire
Desmond Dickerson of the Cognizant Center for the Future of Work
Scott Waller of the Mississippi Economic Council

With $61.4M in external research expenditures

The Bagley College of Engineering
At Mississippi State University

Is a leader in research & economic development

Join us
Demand for Middle-Skill Jobs Will Remain Strong

Between 2012-2022, 57% of job openings will be middle-skill.

Job Openings by Skill Level, Mississippi, 2012-2022

<table>
<thead>
<tr>
<th>Skill Level</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>High-Skill</td>
<td>14%</td>
</tr>
<tr>
<td>Middle-Skill</td>
<td>28%</td>
</tr>
<tr>
<td>Low-Skill</td>
<td>57%</td>
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Source: NSC analysis of long-term occupational projections from state labor/employment agency.

Mississippi’s Forgotten Middle

Middle-skill jobs, which require education beyond high school but not a four-year degree, make up the largest part of America’s and Mississippi’s labor market. Key industries in Mississippi are unable to find enough sufficiently trained workers to fill these positions.

Mississippi students to learn about careers based on their specific interests and to begin developing a workable educational pathway plan with their counselors.

“Mississippi’s Forgotten Middle” is a story of increased demand in middle-skill jobs, part of which is due to data and advanced technologies igniting a shift in the future of workforce across the globe. As a result, along with the national student debt crisis and the opportunity for early entry into the workforce, the traditional route of seeking a four-year degree after high school graduation is becoming a less attractive option for students.

Multiple educational pathways have emerged, and more and more middle-skill jobs are requiring fewer years of higher education than an undergraduate degree.

Looking to prepare students for the future of work, NSPARC developers say Job Scout offers students an opportunity to discover fields such as manufacturing and heating, ventilation, and air conditioning (HVAC), that require one or two years of training. Using valuable information gained from Job Scout, students can work with counselors to register for relevant career-technical programs or courses during their middle school and high school tenure.

Since Job Scout’s release, schools across the state have begun to use the app as a means to better equip their students for life beyond high school.
high school. Barlow explained that Job Scout allows a student to interact with teachers and counselors to create a customized plan toward the student’s desired career path.

However, not all students have smartphones or tablets. To provide teachers with the flexibility of using Job Scout in computer labs to better help all students, regardless of a student’s access to smart devices, NSPARC developers created an additional platform for Job Scout.

“We decided we wanted to make it more accessible, so we created a website version,” Nathan Ansel, senior programmer analyst at NSPARC, said of Job Scout. “With this, teachers and counselors will be able to help guide students towards making career choices and selecting what they want to study, using Job Scout as a base for helping with those decisions.”

Brian Nash, a cyber foundations teacher at George County Middle School in Lucedale, Mississippi, said Job Scout has exposed many of his students to careers and trades they weren’t familiar with. Once students complete their assessments within the application, Nash requires them to further research their desired careers. Once their research is complete, students create a slideshow presentation that they present to the class with

Using valuable information gained from Job Scout, students can work with counselors to register for relevant career-technical programs or courses during their middle school and high school tenure.

NSPARC developers say they also used recognizable verbiage within the app to ensure that each student understands the instructions.

“The goal was to align Job Scout with MDE terminology,” Barlow said. “Students in Mississippi schools should find the terminology familiar.”

Ansel says Job Scout is also closely aligned with MDE’s approach to career selection that divides the world of work into career clusters that contain career pathways, which lead to specific occupations. He asserts that Job Scout helps students to search for potential careers through easy-to-use features, including the Clusters Quiz, Clusters Selection, Pathways Selection, and Interest Quiz.

In an effort to ensure students have the best user experience both within and outside the classroom, Job Scout closely follows the career cluster and pathway model established by MDE.

After creating a profile, choosing a mascot, and logging into Job Scout, students will complete an initial Clusters Quiz that is divided into three categories: “Activities that describe what I like to do,” “Qualities that describe me,” and “School subjects I like.” In each section, students can select answer choices from an extensive list of preferred occupational duties (e.g., “be outside in all kinds of weather”) to specific personality traits (e.g., “good at solving problems”).

Based on the students’ answers, Job Scout recommends three career clusters that match their interests in the Clusters Selection. Students are then prompted to select which cluster best fits them or explore other cluster options. Personalized career clusters range from occupational fields such as STEM to health science, and hospitality and tourism to government and public administration.

After helping students choose a cluster, Job Scout introduces occupational pathways within the chosen clusters during Pathways Selection. For example, a student with an interest in manufacturing can choose pathways such as logistics and inventory control, production, and quality assurance. Pathways Selection helps to further narrow down the unique types of work that may be found in each cluster.

Lastly, Job Scout directs students to an Interest Quiz. During this quiz, students rate a series of actions on a scale of one to five on how likely they would enjoy completing each task. For example, a student may be asked how much he or she would enjoy an activity such as, “study the behavior of an animal.”

The Interest Quiz allows Job Scout to rank occupations that fall within the students’ clusters and pathways. Once the quiz is complete, students are then presented with an extensive ordered list of career options.

According to NSPARC developers, Job Scout acts as a guide for those searching for their niche. Students can see salary information of selected occupations and click a star button to save an occupation as a favorite for later viewing. Students can use career assessment results to work with counselors to start creating a plan for the future.
Other implemented features include videos and stickers to ensure that students find Job Scout to be interactive, informative, and engaging. Job Scout’s library of embedded videos showcase details of each occupation.

“As part of the project, researchers identified videos that allow Job Scout users to get a feel for 990 distinct occupations,” Barlow expressed.

NSPARC developers incorporated the stickers feature as a gamification element, in which students are rewarded virtual stickers for completing each task thoroughly to maintain students’ interest.

“Some of the stickers have multiple levels,” Ansel said. “As students discover more careers, they can level up their stickers.”

Barlow indicated that developers are looking to implement a new feature that will allow users to explore available jobs that are specifically located in Mississippi. This advancement to the app has been highly requested by teachers.

“I think the next step would be to give students some actions they could take to actually connect to the labor market,” he said.

Developers expressed their desire to make progressive changes to the app in the upcoming years. “Job Scout will get better and better as the years go by,” Barlow said. “There’s a lot of things we’re going to be adding to it.”

Barlow and his team are currently creating a new portal tool, specifically for teachers and counselors, for the Job Scout website. Through this portal, teachers and counselors will be able to identify students’ aptitude test results and guide them toward an academic major or training program that reflects their interests. Developers plan to eventually include links to specific related programs and courses offered at community colleges and training centers in Mississippi for the students to explore training options available to them during and beyond high school.

Job Scout is set to be a driving force for middle school students by introducing them to careers that fit their interests. To join in the career discovery, users can download the mobile app from the Apple and Google Play stores, or can access it online at jobscoutapp.com. As technology continues to advance and new generations prepare to enter the workforce, the future is bright with the aid of tools like Job Scout.

Job Scout puts you in control of your future

Download the app today, or visit jobscoutapp.com
When you’re a leader, people watch to see what you’ll do next. Nobody knows that better than Mississippi State University. For years we’ve been leaders in the world of aerospace engineering. MSU now serves as the national lead university for the Federal Aviation Administration’s Center of Excellence of Unmanned Aircraft Systems, putting us on the cutting edge of this new era of research, development and integration into the nation’s airspace. We’re driven to lead the way. Keep watching as we soar to new heights.

NSPARC CARES ABOUT THE COMMUNITY

NSPARC employees recently volunteered in the GET SWEPT UP! event. This annual event, coordinated by the Greater Starkville Development Partnership, works to clean up the streets and public areas of the city of Starkville.

For more info on NSPARC, visit nsparc.msstate.edu.

For more info on community events and programs, visit starkville.org.
Tori: What is the WIOA Hub?

Martin: The Workforce Innovation and Opportunity Act (WIOA) Hub is a headless software solution, created by NSPARC, for the WIOA partners of the State of Mississippi. We refer to the Hub as a “headless” system because it does not have a user interface as with most software solutions we develop. The Hub acts as a central point of communication between the multiple case management systems in use by WIOA partners. Another way to visualize the Hub and its purpose is to think of a post office in the process of sending and receiving mail. The system, just like a post office, has to process every single piece of information (letters) coming or going between the partner systems (mailboxes).

Tori: How did the WIOA Hub come about?

Cory: The WIOA, signed by President Obama in 2014, was one of many events that led to the realization of the WIOA Hub in Mississippi. The U.S. Departments of Labor and Education issued final WIOA regulations on how to carry out the law on June 30, 2016. The regulations required more integration among certain state partners involved in the delivery of workforce-related services, but it also gave the states a lot of freedom in how to achieve this new level of integration.

Mississippi, through its WIOA plan, decided to integrate the service delivery of its four core workforce agencies electronically. Thanks to the WIOA Hub, the Mississippi Department of Employment Security (MDES), the Mississippi Department of Human Services (MDHS), the Mississippi Department of Rehabilitation Services (MDRS), and the Mississippi Community College Board (MCCB) are now able to exchange real-time information related to the delivery of services for their mutual clients.

Tori: What need was NSPARC trying to meet with the development of the WIOA Hub?

Martin: In addition to meeting the requirements of WIOA that center around well-documented business rules, we also had to overcome the inherent challenges of creating a solution to allow four separate systems from four different state agencies to exchange information. One critical need that we addressed was to come up with a common method for all systems to communicate and exchange information with the Hub. NSPARC staff created an Application Programming Interface (API) to allow interoperability among all the systems. Each agency made modifications to their existing systems to communicate with the API. Retaining existing systems cuts down on training costs and minimizes disruption since staff does not need to learn how to use an entirely new system.

Tori: How do NSPARC developers ensure that the WIOA Hub is secure in its data transfer?

Cory: NSPARC uses industry standard authentication and encryption practices to ensure the protection of data. All traffic to and from the Hub is encrypted in transit, and all endpoints are protected by OAuth token-based authentication using cryptographic keys unique to each agency. All data objects stored by the Hub are encrypted at rest. The Hub is hosted in state, secure data facilities owned and operated by the state of Mississippi. The Hub is regularly scanned for vulnerabilities and is protected by continuous traffic monitoring systems.

Tori: Has the WIOA Hub improved partnerships with state agencies?

Martin: Yes. Even though it is still early in the process (the final WIOA partner started using the Hub in production in July), we are now able to quantify the number of referrals sent between agency partners. For example, since January 1, 2019, WIOA partners sent more than 23,000 referrals to Mississippi’s workforce agency to help WIOA customers find jobs or get training that leads to work. About 5,700 referrals were sent to MDRS to help Mississippians with disabilities find new careers, live more independently, overcome obstacles, and face new challenges. About 9,500 referrals were sent to MDHS to help connect vulnerable workers with services to overcome food insecurity, childcare, and other needs. Finally, about 11,000 referrals were sent to Adult Education providers in Mississippi to help connect adults with the training and credentials needed to secure a better job. Before the implementation of WIOA, there were many procedural inefficiencies that made it difficult to achieve an interagency referral, much less to quantify the referrals. This helps fulfill WIOA’s goal of reducing the chance that a Mississippian falls through procedural cracks in the system.

The final piece of WIOA’s partnership strategy is the interagency success plan. Agencies are working now to implement this individualized case management coordination plan in their case management systems, and the Hub is ready today to receive and make this exchange possible. The success plan will further strengthen existing partnerships around the idea of helping all people to find independence through work.
ABOUT NSPARC

Known primarily for our work in support of smart government, NSPARC has achieved national prominence with its use of data science (the field of study that examines new methods for the use of data) in economic development, workforce development, education, and delivery of human services at all levels of government.

NSPARC has extensive experience in the application of data science in every major area of enterprise software development, data security, and IT infrastructure, including:

- Case Management
- System Design and Coding
- Mobile Development
- Reporting and Regulatory Requirements Gathering
- User Experience/Interface Design
- Electronic and Digitized Paper Record Handling
- Real-Time Consumption of Third-Party Sources of Information
- Interagency Coordination Systems
- Data Security and Monitoring

OUR EXPERTISE

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OUR VISION & MISSION

Our vision is to become among the best in the data science field by using the smart-city concept as an intellectual framework.

Our mission is simple: to advance the use of data science to drive human progress.

We seek to lead a data revolution for the betterment of our global society.

IMAGINE A BETTER WORLD.
WE ARE.

Imagine a world where sustainable energy powers our daily commute and where our nation is safe from cyber-attacks. Imagine a world where food shortages are replaced with food abundance and where the flu is something our children will read about in history books. Imagine a world where the spark of an idea can grow into a solution that molds the future. Imagine a world where inspiration gives birth to innovation. We are, at Mississippi State University, where we ring true. MSSTATE.EDU