Expanding the Competition

The largest statewide startup competition in the country attracted more than 1,500 entrepreneurs and awarded winners in eight divisions, including its new youth division.
Expanding the Competition

The MN Cup competition continues to open doors for more entrepreneurs, thanks to its enthusiastic corporate supporters, volunteer mentors and $400,000 in seed money.

By Suzy Frisch

The Minnesota Cup has served as a model of innovation for thousands of entrepreneurs since it launched in 2005, growing into the largest statewide startup competition in the nation. It continues to evolve and expand, striving to become more inclusive each year, and this year is no exception.

Led by director Melissa Kjolsing, the Minnesota Cup’s effort to diversify its participant pool to include more women, minorities, youth and statewide entrepreneurs has paid off. This year, 38 percent of competitors were women-led—a boost from 25 percent in 2013, before the organization started working to increase female participation. Additionally, underrepresented minorities accounted for 25 percent of all applications submitted.

The Minnesota Cup has successfully integrated itself into the state’s entrepreneurial ecosystem, becoming an essential step for people who want to start a business or attract investment. Since the Cup’s inception, more than 11,000 entrepreneurs have competed in the event with finalists raising over $225 million in investments.

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Special Award Prizes

- Carlson Family Foundation awarded $25,000 to Asiya for the top woman-led startup.

- Meda awarded $10,000 to Asiya for the minority entrepreneur with the most innovative business concept.

- Securian Financial Group awarded $10,000 to Sezzle for an innovation that shapes the future of financial services through technology.

- Capella awarded $10,000 to FanSchool for the most innovative education technology that promotes learning solutions.

- AARP awarded $5,000 to Farmhouse Market for innovation that improves access for low-income seniors.

2016 MN Cup by the Numbers

1500+ participants

1 in 4 applications submitted by a minority entrepreneur

26 startups received prize money

38% of applications submitted by women

$400,000 awarded

Grand Prize Winner Review Board Members

Margaret Anderson Kelliher | MHTA
Arnold Angeloni | Engineering America
AJ (Andrew) Austerman | Wells Fargo
Allison Barmann | Bush Foundation
Gina Blayney | Junior Achievement of the Upper Midwest
Cathy Connet | CorConnections
Carolyn Cleveland |
Dave Cleveland | Riverside Bank (retired)
Justin Cox | Arthur Wayne
Lisa Crump | Carin Ventures
Laurent Frecon | LFE Capital
Skip Gage | Gage Marketing
Michael Gorman | Split Rock Partners
Sima Griffith | Aethlon Capital
Kristin Gunther | Revolution
Fred Haberman | Haberman
Gary Holmes | CSM Corporation
Mark Johnson | Star
Joel Lebewitz | Lurie
Brad Lehman | Soffer Charbonnet Law Group
Jeremy Lenz | Lenz Consulting
Beth Leonard | Lurie
Howard Leonhardt | Leonhardt Ventures
Joy Lindsay | StarTec Investments
Scott Litman | Equals 3
Dan Mallin | Equals 3
Shaye Mandle | Medical Alley
Shawn McIntee | Maslon
Kari Niedfeldt-Thomas |
Whitney Place | Minnesota Department of Agriculture
Joanna Ramirez Barrett | MEDA
Jeff Robbins | Messerli & Kramer
Thom Sandberg | Kenyon Consortium
Joel Schleicher | Presidio, Inc.
Tom Vanderheyden | Harken Health

Mentors of the year:
PETER GOLDREICH
KRISTEN HEIMERL
MARK MOE
LIFE SCIENCE AND HEALTH IT

StemoniX

Battling cancer with four months of chemotherapy in 2012, Ping Yeh learned that his body was resistant to the medications. His physician prescribed even more toxic therapies as the only treatment option. Yeh received the drugs not knowing whether they would kill him or cure him of lymphoma.

He survived the treatment and the cancer and came away from the ordeal with an idea: find a better way to test drugs and their effectiveness before giving them to people. Yeh pulled together a diverse team of scientists to start Stemonix in 2014, striving to help pharmaceutical companies develop medications that work the first time.

It's critical because 100,000 people die annually in the United States from adverse drug reactions—the fourth-leading cause of death. Part of the problem is that drug manufacturers do most of their testing on animals and a limited number of people, and testing is only one part of the drug approval process, which typically takes over a decade to complete. Twelve years and billions of dollars later, they don't often know how their drugs will affect people from diverse ethnic backgrounds, says Yeh, CEO of the Minneapolis-based company.

Stemonix developed a way to mass-produce stem cells and create micro-organs from human skin, blood or fat. Researchers are able to test potential medications on a much broader scale earlier in the drug development process, potentially reducing the need for animal testing.

"We make billions and billions of stem cells and organ cells and put them on standard screening plates so people can see if certain compounds are toxic or work on diseases."

—Ping Yeh, CEO

PRIZES FOR THE WINNER

$50,000 grand prize
$30,000 in seed capital
Environmental marketing audit and $1,000 toward display element from Star
Accounting assistance from Lurie
Professionally produced and edited video of final pitch at Grand Prize judging round courtesy of TECHdotMN
Scholarship to the Minnesota High Tech Association's Annual Minnesota Venture Conference
“I think it will change how drug discovery is done,” Yeh says. “If a company can build a clinical trial on a plate, they will be much more successful. We believe we have a better, more humane and accurate way to test drugs for our diverse population before [the products] go out into the world.”

Yeh, a mechanical engineer with a master’s degree in mechanical and nanotechnology and an MBA, has worked at Seagate, Dell and other companies, leading teams that turn technology into products. He’s applying his corporate entrepreneurship to lead Stemonix from startup in 2014 to product development. Kicking off sales in June, Stemonix has landed three of the 10 largest global drug makers. They are attracted to Stemonix’s ability to meet their testing needs for conditions from Alzheimer’s to Zika. By using a form of 3D printing, the company makes stem and organ cells in large quantities. This helps academic institutions and companies do research, as well as deep and broad screening of potential therapies.

“Our core competency is scale,” Yeh says. “We make billions and billions of stem cells and organ cells and put them on standard screening plates so people can see if certain compounds are toxic or work on diseases.”

Currently, Stemonix is focused on selling its stem cells to pharmaceutical companies, building enough revenue to ultimately break into personalized medicine. That effort is three to five years down the road, Yeh says, and it will take FDA approval and significant revenue first.
Users of ride-sharing services like Uber are a captive audience for advertisers. Vugo—as in “views on the go”—is helping companies reach these potential customers with high-quality, targeted content on a national scale.

COO James Bellefeuille saw the power of content in motion when he was driving for Uber as a side gig. A restaurant owner asked Bellefeuille to put menus in his backseat, and he saw how often customers looked at the menus or asked to be driven to the restaurant instead of their original destination.

Bellefeuille teamed with CEO Rob Flessner in 2014 to begin developing Vugo, aiming to create a digital and more targeted version of those menus. Using demographics and other trip information gleaned from companies like Uber and Lyft, Vugo applies its TripIntent algorithm to deliver relevant digital media, programming and ads through tablets secured to the backs of the vehicle’s headrests.

Vugo content is far different than traditional video playing in taxicabs or other mobile locations, Flessner says. That content typically comes from network feeds without much advertising, and it’s designed and displayed primarily to take credit card payments.

“But in ride-sharing, they don’t care about credit card processing. They make their money by engaging passengers,” Bellefeuille says. “We want to make sure the media we display is relevant and contextual to passengers’ immediate trip and purchasing intent. We’re focused on the genuine entertainment of the passenger.”

For example, customers heading out at night might see ads promoting alcohol brands or specials at nearby clubs and restaurants. Others going to the grocery store might get content about cooking trends or recipes. And to encourage the 750,000 existing rideshare drivers to offer Vugo content, the company pays them an hourly bonus.

Vugo started with a beta version in 2015, collecting data from 22,000 trips with 3,000 participating drivers. Though in operation currently, the company is now fine-tuning its offerings and will relaunch over the next 12 months in New York, Los Angeles, San Francisco and the Twin Cities.

Although the company’s headquarters are in Minneapolis, Bellefeuille is based in Los Angeles, where he works to build relationships with content providers. Vugo recently formed a relationship with one of the top seven content-rights holders in the world, but Bellefeuille can’t name names yet.

The partners believe they have a strong pitch to advertisers, who are eager to reach highly desirable ride-sharing customers. They skew young, male, and college-educated, with 80 percent holding a bachelor’s degree or higher, and 40 percent earning at least $100,000.

“Millennials and young and older adults are using Uber for transportation every day, and people who understand advertising think it’s a great opportunity,” says Flessner. “We want to change those cars into mobile entertainment units that are as comfortable as people’s living rooms.”

And while the ride-sharing market is still growing and projected to grow even more—to $1.5 trillion by 2030—Vugo also plans to tap into the self-driving car market as it evolves.
For many Muslim girls and women, it’s hard to exercise while staying modest. This obstacle kept girls away from sports, so Fatimah Hussein created a space for Muslim girls to be active in 2008 at the Brian Coyle Center in Minneapolis.

Then a college student and Somali youth worker and community organizer, Hussein saw the girls struggle to play well and safely in their long skirts and the traditional head coverings, known as hijabs. Hussein partnered with Chelsey Thul, now a kinesiology lecturer at the University of Minnesota, to create culturally appropriate uniforms and head coverings that encourage girls to be active.

They secured a two-year grant and designed functional and modest uniforms and hijabs with input from the girls, coaches, community members and others from the university’s College of Design and Tucker Center for Research on Girls & Women in Sport. After a fashion show to debut the sportswear in 2015, civic leaders and businesspeople encouraged Hussein to start a company to sell the clothing.

Hussein reached out to the U and connected with MBA student Jamie Glover. Together they launched Asiya to bring the sportswear hijabs to a larger market. Girls can wear leggings or long-sleeved shirts underneath traditional uniforms to stay modest, says Hussein. But they have fewer hijab options for sports. The girls—and their mothers and sisters—kept emphasizing the scarcity of head coverings that don’t fall off easily and aren’t too hot or itchy. The lack of gear acted as a barrier to their physical fitness.

“We found out that the number of Muslim females participating in sports is much [lower] than any of their peers,” says Hussein, who is CEO, as well as a social worker for Ramsey County. “We want to make it possible for girls to be able to compete and not say, ‘I can’t because of my clothes.’ There shouldn’t be this barrier.”

Asiya will make three breathable styles in traditional sportswear material for varying levels of modesty. With 1.5 million Muslim females in the United States—and 9 million around the world—the company has a significant and growing market. Asiya first will target the 10 states with the largest Muslim populations, which includes Minnesota.

Another sales channel will be through sports leagues. This winter, Asiya hijabs will be promoted through the Minnesota State High School League uniform catalog, and Hussein has plans to do the same with similar national organizations.

The hijabs are currently manufactured in California, but Hussein will soon move manufacturing to Minnesota, aiming to find partners to start a sewing program that would train minorities to create Asiya’s hijabs.

No matter where its products are made, Hussein will stay focused on a macro goal. “I want to build a brand that is for the girls and by the girls,” she says. “If she says the product is good and it helps her compete and enjoy her team without having to pin her hijab—then our work is good.”
In competitive cycling, every gram counts. Bikers are always looking for ways to shave weight off their gear in pursuit of a faster ride. Roseville-based Berd Spokes has developed one solution with its new wheel spokes, weighing less than half of traditional racing bike spokes.

Charlie Spanjers, a chemical engineer, teamed up with friends from the University of Minnesota to turn a polymer called ultra-high molecular-weight polyethylene into spokes. Spanjers, Brad Guertin and Kyle Olson, all engineers and cyclists, enjoy coming up with ideas to pursue together, and they believed that using the polymer for bike spokes had potential.

Although the polymer is flexible, it’s the strongest material in the world on a per-weight basis, Spanjers says. It’s often used in sailing components and woven into rope replacing traditional steel cables on oil tankers. The outdoor-hardy material can withstand the elements, as well as UV radiation.

Finding a fresh application for a relatively new, flexible material worked to the inventors’ advantage. “No one has done this before because it’s not intuitive that a flexible material, like a shoe lace, could be so strong,” Spanjers says. “They don’t think it could be used in a strong-fit structure like a bicycle wheel.”

But Berd made it happen. The partners worked with a manufacturer to turn the polymer into a braided fiber that they could transform into spokes. They also developed a way to connect the spokes to any bike wheel using a standard stainless steel mechanism.

The partners started working on their first prototype in March 2015 and by last August had developed it into their current product, which is patent pending. Berd will be entering a lucrative space, encompassing the $600 million high-end wheel and $50 million high-end spoke markets in the United States and Europe. There also could be applications for Berd’s polymer hub-and-spoke system in aerospace, sailing and other industries.

By decreasing a racing wheel’s weight by 15 percent, or 140 grams, Spanjers believes Berd’s lighter spokes will be a winner for cyclists. “That doesn’t sound like a lot, but once you get down to the best equipment that performance cyclists use, shaving off 140 grams is a pretty big deal,” he says. “Cyclists really care about lightweight equipment and they spend a lot of money to get it.”

A manufacturer and professional cycling team in Europe are testing the spokes and providing feedback and test data to Berd. The company currently sells wheels with its spokes, but plans to eventually sell its spokes directly to wheel manufacturers.

It hasn’t been easy to get the company rolling with all three partners still working full-time jobs. But the challenge has been worth it, Spanjers says, for the reward of designing and inventing something new for a sport he and so many others enjoy.
It takes weeks and a significant investment of time and money to analyze the chemical make-up of substances. Whether scientists are determining the chemicals in biofuels or processed food, it’s a complicated process that’s remained constant for 60 years.

But thanks to research from the University of Minnesota, alumnus Andrew Jones was inspired to develop a simpler process for chemical analysis. Jones, who has a Ph.D. in chemical engineering from Berkeley, teamed up with former Proto Labs CEO Brad Cleveland to launch Activated Research Company (ARC) in 2014.

By April 2015, the Eden Prairie-based company developed the Polyar system, which simplifies chemical analysis by using a micro-reactor to convert all of an item’s compounds into methane. Having one compound to analyze instead of hundreds of thousands helps scientists analyze chemical components more quickly and easily.

Analysis technology hasn’t kept up, even as scientists need to analyze increasingly complicated chemicals. Polyar helps scientists get a handle on complex molecules quickly, more accurately and with less effort. “There will be fewer chances of mishaps happening, and consumers will have better products as a result,” says Jones, CEO. “And in some key industries it might even save lives.”

ARC is initially focusing on selling Polyar to the chemical, petrochemical and biofuel sectors. Jones has long had an interest in energy and saw the need to quickly and accurately assess the properties of renewable fuels. Converting a plant or tree into biofuels generates thousands of chemicals. Polyar gives the industry tools they didn’t have before to more accurately assess the compounds and analyze the quality of their products.

Polyar works seamlessly as an add-on device with existing scientific equipment. Scientists run their samples the same way they did before, but without the extra step of calibration, which adds hours of work to an analysis. The add-on capability has made sales and training go smoothly for ARC.

Initiating sales less than a year ago, the company already has made strong inroads into customers’ research and development groups. Once scientists see the benefits of Polyar, such as how easy it is to integrate and use, businesses start deploying the device more broadly, says Kim Herzog, director of strategy and market development. In addition to direct sales, ARC also sells Polyar globally through custom integrators and instrument manufacturers.

Polyar is quickly being adopted in the biofuels industry. “They’re telling us it makes their analysis much better and more efficient,” Herzog adds. “With our product, they can complete their analysis in a day.”

The ARC team isn’t stopping with Polyar. Jones aims to solve big problems with other products that use the power of catalysis to speed up chemical reactions, so stay tuned.
SelfEco Garden

Landfills in the United States take in 200 million pounds of plastic garden pots annually, where they sit for generations without decomposing. Stillwater-based SelfEco Garden developed compostable pots that keep plastic out of landfills while doing double-duty as a yield booster.

Developed by third-generation manufacturer Danny Mishek, SelfEco pots are made from a plant-based plastic polymer. The material is infused with nutrients left over from the distilling process. Called distiller’s grains or DDGs, they are incorporated into SelfEco’s raw material and continually feed plants without the need for fertilizer.

In studies conducted at Iowa State University this summer, plants grown in SelfEco pots grew faster, bigger and produced at least twice as many vegetables as traditionally grown plants. SelfEco pots foster growth because DDG stays in the ground with the plants’ roots, while traditional fertilizer is applied to topsoil and often gets washed or blown away, says Mishek, founder and president.

SelfEco addresses numerous environmental issues while also increasing yields for gardeners and growers, Mishek says. In addition to eliminating the need for fertilizer, which seeps into groundwater, it also reduces demand for petroleum-based consumer products.

SelfEco pots also could put a dent in world hunger because of their success in growing produce. “It’s really exciting to see that you can get more food with the same amount of land and without using fertilizer, that benefits a lot of people,” Mishek says.

Mishek first learned about plant-based polymers while serving as president of the region’s Society of Plastics Engineering. He started SelfEco in 2015 determined to put the material to use, but quickly found that industry folks were frustrated that the plant-based polymers didn’t hold up as well as traditional plastics. Instead of viewing that as a negative, Mishek decided to take a different angle. “We designed around the flaws of the material,” he says. “We knew there is a huge market for things that don’t need to last forever.”

SelfEco started testing the material and developing its garden pots this past spring, filed patents and completed testing in Iowa. The company buys the raw material, made from corn roots and stalks, from a supplier in the Midwest. It manufactures SelfEco pots at its sister company’s facility, VistaTek, an injection-molding business owned by the Mishek brothers.

Excitement for the compostable pots started building through a Kickstarter campaign earlier this year, which not only attracted outside investors, but also brought in $25,000 in 30 hours. Knowing that SelfEco couldn’t get to market in time for the 2016 growing season, Mishek is pursuing orders and giving quotes for next spring to wholesalers, growers and traditional and online retailers. SelfEco has already begun shipping pots to customers and aims to ramp up to full production by the end of the year to prepare for spring orders.

“From the beginning of time we’ve been eating plants, and we’re bringing a disruptive technology to the plant-growing world,” Mishek says. “It’s been a crazy roller coaster.”
Striving to develop a strong, hard magnet made from simple elements, Md Mehedi had a spectacular failure back in 2013 that produced a soft magnet instead. The unexpected result after months of work was, unsurprisingly, very discouraging for Mehedi, a materials science doctoral candidate at the University of Minnesota.

But his professor, Jian-Ping Wang, thought the new magnet material might have potential. Mehedi and Wang spent the next year and a half working to discover how they had developed this novel new material and explored its use as a strong magnet.

“It was an accidental discovery, and we were not expecting it. We had to find out why it happened,” says Mehedi.

Once the researchers nailed that down, they unlocked the potential of this new material and named it minnealloy. They have two patents pending, held by the University of Minnesota. Their discovery prompted Mehedi and his team, Taskin Haque and Blake Wolf, to start Minnealloy Magnetics, a company they will eventually launch as the team gets closer to commercialization.

Minnealloy is appealing because it is 50 percent smaller and lighter than ferrite—the material currently used in electronic components—and 5 to 7 percent more efficient. It’s a big breakthrough in an area that hasn’t seen many advancements lately. “In the magnetic world, the last big discovery was almost 40 years ago. It was expensive and it wasn’t commercialized very well,” Mehedi says. “Minnealloy will be comparable in price to the current materials.”

Mehedi sees significant potential for minnealloy because of its broad application in anything that generates power. It could be used in the transformers and inductors that help run wind turbines, solar cells, electric cars, electronic devices, cell phone chargers and more.

Many industries are likely to capitalize on the material’s promise, including consumer electronics or electric cars. Their customers constantly demand smaller devices without compromising price and efficiency, and Minnealloy will help manufacturers meet those demands, he says.

The Minnealloy team also was motivated to create a magnet with easily available elements. Hard-magnet manufacturing requires rare earth metals, 95 percent of which are found in China. “The elements we use are easily available, cheap, and don’t create any [barriers for] the United States,” Mehedi adds.

Minnealloy is currently fine-tuning its technology and making prototypes for testing, work that will continue next year. Starting sales will take time, as potential customers will want to test minnealloy themselves, develop standards and demonstrate how well it works in their own products. The testing phase at the university and with potential customers will be critical for Minnealloy as it seeks to commercialize the material in 2019 and beyond.

“This is a disruptive material that will need to be validated in the market. We will have to make our case, specifically that the technology is very solid for potential customers, and that it’s helpful to them,” Mehedi says.
Meghan Sharkus watched Jessica, her best friend from childhood, struggle with Type 1 diabetes for nearly a decade. Jessica was often worried and self-conscious about her insulin pump, especially when swimming, playing sports or answering numerous questions from other kids.

Wanting to help her friend and 200,000-plus other kids with diabetes, Sharkus set out to make a functional adhesive insulin pump cover that would bring additional safety—even fun—to the vital medical device. She started ExpressionMed, creating a variety of peel-resistant medical tapes with cool designs. One adhesive covers the device’s infusion set, which delivers insulin through a tube to the body, while a second sticker covers the clip that connects the infusion set to the pump.

Sharkus first whetted her appetite for innovation when she was in grade school at Camp Invention in Brooklyn, Wis. In high school, she joined DECA, a business leadership program, and developed advocacy campaigns for youth with chronic diseases. When her diabetes idea struck, Sharkus developed a business plan for ExpressionMed through DECA.

She threw herself into the project, gathering market research through surveys included on diabetes camp registration forms and interviewing physicians. Sharkus even cold-called the University of Wisconsin-Madison seeking advice, and lined up MBA-student mentors to help with financial planning.

Sharkus is gathering customer feedback to fine-tune the final designs before she launches manufacturing this fall. She plans to sell the products on ExpressionMed’s website beginning in November.

Sharkus is gathering customer feedback to fine-tune the final designs before she launches manufacturing this fall. She plans to sell the products on ExpressionMed’s website beginning in November. She’ll be reaching a growing customer base—by 2050, the Centers for Disease Control and Prevention estimate there will be 5 million people in the United States with Type 1 diabetes, including 600,000 youth. Pump users must replace their infusion sets every two to three days, which means a new sticker after each replacement.

“In the U.S. alone, 31 million infusion sets are placed on youth annually. And those 31 million interactions are pain points in the lives of kids and parents,” says Sharkus, adding that one in seven kids with diabetes are depressed. “I thought that by bringing this to the diabetes community, we [could] make kids happy and keep them safe.”

Increasing safety is a key element of the ExpressionMed product. The large stickers increase the surface area covering the infusion set, helping to prevent the device from falling off and stopping the flow of life-saving insulin.

ExpressionMed will offer designs like a leaf that covers the infusion set paired with a ladybug that covers the clip. There are also football fields with a football, a car and street, hearts and polka dots.

Sharkus also is working on co-branding adhesives with organizations such as children’s hospitals and diabetes camps.

Now a freshman at University of St. Thomas, Sharkus hopes ExpressionMed will help reduce stress for kids with diabetes. “I want to change a necessary medical device from [being] something negative to something positive,” she says. “I want to make life way happier for kids with diabetes.”

**PRIZES FOR THE WINNER**

- $10,000 in seed capital
- Professionally produced and edited video of final pitch at Grand Prize judging round courtesy of TECHSourceMN
- Scholarship to the Minnesota High Tech Association’s Annual Minnesota Venture Conference
**Key Log Rolling**

Aby Hoeschler wanted to share her passion for logrolling, a competitive sport where two people balance on a floating log and try to roll the other off by spinning the log with their feet. But she was confronted with a 500-pound cedar log obstacle. A repeat logrolling world champion, Hoeschler set out to find a way to spread the word to others. She developed a portable, lightweight synthetic log that closely mimics the real deal.

Hoeschler worked with University of Minnesota business students and Winona State University engineering students to develop and market the 65-pound Key Log. It’s made from recyclable high-density polyethylene and filled with water.

After soaring sales in 2013, the Key Log caught on with the YMCA, summer camps and college recreation programs. Hoeschler says it’s an easy sell because they always are looking for fresh ways to encourage exercise. Log rolling is catching on, thanks to Golden Valley-based Key Log Rolling’s product, training programs and national publicity.

**Awear Technologies**

Ten million students struggle, chronically or periodically, to stay focused, drastically affecting their ability to learn. Awear Technologies of Pine City is developing training glasses that unite wearable devices and neurofeedback to improve kids’ concentration.

Called the ConfidBoost Trainer, these high-tech glasses are geared toward the 30 percent of kids who read below grade level, have ADD/ADHD or struggle to concentrate. It works by detecting brain activity and darkening the lenses when users lose focus. Until they refocus, they can’t see through the glasses.

Awear’s 10- to 12-week training helps users improve their concentration and reading abilities, targeting kids 4 to 17, says founder and CEO Rod Greder, a long-time educator and entrepreneur. Awear secured $500,000 in grant funding to continue developing its glasses.

**Tree Trainer**

Growers and retailers scrap more than 9 million deformed trees annually, a loss topping $735 million. Roy Enterprises developed a new option to save trees: a self-supporting brace called the Tree Trainer, which eliminates the need for traditional stakes and wires.

The Tree Trainer uses oppositional pressure to fix deformities. After 30 to 120 days, the tree’s fibers will correct themselves and grow straight, much like a bone in a cast will heal properly if stabilized, explains Jarred Roy, who started the company with his dad, Jim, and his friend, Shawn Wolfe.

Jim designed the Tree Trainer after tiring of staking and trimming trees on his farm. His son saw its potential, patented the design and started selling through landscaping distributors and retailers, including Home Depot and Lowe’s.

**Da Bomb Bath Fizzers**

The company that “sisterpreneurs” Isabel and Caroline Bercaw started before they were even teenagers is no joke. Da Bomb Bath Fizzers sells in 1,500 stores nationwide; the company employs 50 people and is now a full-time family enterprise based in Edina.

The Bercaw girls aimed to create a bath bomb that didn’t leave the user and tub sticky. They made their first products from simple ingredients and sold out in their debut at the Uptown Art Fair in 2012.

The fizzers first landed in a local salon, then became official as Da Bomb in 2015. The bath bombs appeal because they are handmade locally, are all-natural and reveal surprises, such as a toy or jewelry, when the fizz ends, says Caroline, 14. Isabel is 15; together they are co-chief creative officers. Da Bomb also sells its bath fizzes online and through wholesalers.

**mXers Audio**

Countless earbuds have been trashed because one component stopped working. After it happened again to Bharat Pulgam, he decided to create a less-wasteful and -expensive option. He started mXers Audio and developed fully modular earbuds with five replaceable components.

A Wayzata High School student, Pulgam took his concept to the Catapult Chicago incubator, where mXers Audio earned an innovation award. He formed a team of students to continue developing and testing the product, received a provisional patent and began sales this summer.

mXers Audio sells its modular earbuds on its website and Amazon. With a six-month average life span for traditional ear buds, the company should have plenty of customers. Eventually, Pulgam aims to develop customizable ear buds and other products like charging cables.

**Leozarb**

Furqan Syed thought Spanish would be one of his easier classes in high school, but it wasn’t the case.

Struggling with vocabulary memorization, he aimed to improve how kids learn a second language. Syed developed an app that helps students learn languages in a more fun and captivating way.

As a student at Mounds View High School, Syed was active in Junior Achievement and pulled together a team to make an iPad-compatible app. They created Leozarb, a series of stories that engage middle school language learners with interactive content that teaches the curriculum, says Syed, now majoring in computer science at the University of Minnesota.

Leozarb is still developing and testing its app, and ultimately plans to sell custom versions to schools and offer a free version on iTunes.
Many companies have repetitive, detail-oriented tasks that are crucial but unpopular, such as software testing and data management. But for many people with autism, delving into those details is a joy. Mind Shift helps businesses meet their needs with individuals on the autism spectrum who often struggle to find meaningful work.

Modeled after a Danish nonprofit, Mind Shift started in Fargo-Moorhead in 2014 and recently expanded to the Twin Cities. The nonprofit staffing agency recruits and trains prospective employees, consults with businesses to identify opportunities and helps with onboarding. Mind Shift has placed about 20 employees since its inception in 2014.

“Many of these folks are left out of the workforce,” says executive director Tony Thomann. “Our folks are concrete thinkers with an eye for detail.”

Typical brow lift surgeries are no joke, often requiring weeks of recovery. Zift Medical of Minneapolis is developing a minimally invasive method with a new implant that could move the procedure to the doctor’s office.

Called the ZiftLift, the cosmetic procedure involves four to eight 1-millimeter incisions to place tiny pins. The pins’ expanding petals securely anchor to the skull and lift the soft tissue 5 to 8 millimeters, says CEO Eric Simso. Recovery happens in about three days, with no bruising or scarring.

The ZiftLift will appeal to people who previously avoided brow lifts because of the long recovery time, Simso says. The company is currently enrolling patients in clinical trials for the implant under a fast-track FDA approval process.

Ed Christopher experienced the power of rushing water while growing up on the Mississippi River. Harnessing that power, he started Minneapolis-based Verterra Energy, creating renewable hydroelectricity without the negative impacts of a dam.

Christopher developed Verterra’s Volturunus turbines for river bottoms, oceans and man-made canals to capture the kinetic energy of flowing water. Placed in pods of five, the turbines produce 50 kilowatts of power without harming the ecology.

With numerous patents and more than $500,000 in investments, Verterra is poised to become a viable option for clean energy. Christopher aims to bring hydroelectricity to countries that lack broad-based power generation, but will first focus on ramping up turbine production.

When someone is diagnosed with hypertension, it can take 65 weeks to control their high blood pressure due to trial and error with various medications. Geneticure is working to slash that time to six weeks by identifying the right therapy with the power of pharmacogenetics—how a person’s DNA affects their response to drugs.

With a cheek swab, the company identifies 14 genes whose markers determine the most effective medication, says Ben Bowman, senior vice president of strategy and business development. The company targeted hypertension because it’s one of the largest contributors to disease in the U.S., with 5 million diagnoses per year and 30 million people with the life-threatening condition. Launched in 2014, Geneticure recently started selling to health care systems.

Since the dawn of electricity, its stumped scientists on how to prevent electrical sparks from damaging expensive equipment. Arc Suppression Technologies found the answer with its NOsparc arc suppressors, which eliminate arc energy from power contactors and relay switches, preventing motor failure and expanding the life of equipment.

The Bloomington-based company has a ready market of businesses with significant HVAC, refrigeration or freezing needs, such as grocery stores, which face huge losses when a commercial refrigerator fails. The technology also has railroad and industrial applications.

The patented technology extends the life of equipment by tenfold, saving companies thousands of dollars, while also reducing the burden of preventive maintenance, says CEO Bob Thorbus.
Sezzle

As an online merchant, Charlie Youakim experienced firsthand the high fees associated with debit cards and mobile payments. Youakim launched Sezzle in Minneapolis this fall to provide a merchant- and consumer-friendly way to process debit transactions by using an electronic debit payment platform, a direct bank-to-bank transfer.

Sezzle cuts processing fees in half while offering consumers a 1 percent cash-back reward and mobile payment option. Merchants easily add Sezzle as a payment option at checkout, either online or at the store, and consumers securely link their bank accounts to the Sezzle platform.

Calling it PayPal 2.0, Youakim says Sezzle has a big opportunity because 63 percent of millennials use a payment method other than a credit card.

Token of Trust

As online marketplaces become a larger economic engine, it’s increasingly vital to learn about the parties involved in a transaction. Token of Trust of Minneapolis offers a way to engage with confidence by providing identity verification to online businesses.

Darrin Edelman and his team powered up Token of Trust to develop tools that guard against fraudsters and cyber-criminals. It verifies users by cross-referencing data from government-issued IDs, credit cards and profiles on sites such as Facebook and LinkedIn.

The company quickly experienced high demand from smaller businesses, including property rental companies and dating websites. Token of Trust offers three pricing tiers for marketplaces, and is expected to become a $1 billion revenue opportunity in five years.

Bolton Bees

Chiara and Travis Bolton mastered the art of breeding bees to survive harsh Upper Midwestern winters. With Bolton Bees of St. Paul, the couple sells Minnesota-hardy starter colonies and queen bees with pleasant tempers and hives with high honey yields.

Launching in 2014, Bolton Bees has established itself as a go-to supplier of non-migratory bees and producer of Minnesota honey. The company sells its bees as fast as it can breed them, clearing out this year’s inventory in just two weeks without advertising.

Losing bees to the cold is a serious problem; in 2015, nearly 60 percent of colonies in Minnesota died. Bolton Bees, however, has a 93 percent success rate with its Minnesota-hardy bees. “I’m driven to create this better bee for our climate,” says Chiara Bolton.

Far North Spirits

Cheri Reese and Michael Swanson want to make Minnesota known as the home of rye whiskey. They started Far North Spirits to make craft-distilled spirits using grain from Swanson’s fourth-generation family farm in rural Hallock.

After tackling challenging careers in the Twin Cities, the couple shifted gears to agriculture. Reese and Swanson decided to turn their grain into field-to-glass spirits, planting their first crops in 2012.

Far North started out with Solveig gin in 2013. It now produces a second gin, as well as rum, vodka and rye that is sold across the country at hundreds of restaurants in eight states. Anticipation is high for its small-batch Roknar rye whiskey, which has sold out before it’s even been bottled, Reese says.

Nesel Packs

For many children with autism, wearing a weighted vest provides calm and comfort if they feel overstimulated, but it can make them look different. A team of University of Minnesota business students developed a backpack to help, and Martha Pietruszewski and Jake Portra brought it to market as Nesel Packs.

The Minneapolis-based company is breaking ground with its sensory-friendly backpacks that combine the weight of a vest with the functionality of a backpack. “Kids can wear them to school and during stressful times but not stand out,” says Pietruszewski, CEO.

Pietruszewski lined up manufacturing with Minnesota-based Battle Lake Outdoors to create the sturdy bags that Nesel Packs sells globally to kids with autism.

Blue Dog Denim

Most women know the frustration of jeans shopping. Every brand has a different sizing system, and it takes trying on pair after pair to find ones that fit. Blue Dog Denim of Minneapolis has the answer, with jeans that are sized like men’s but designed for women.

Formed by three recent St. Olaf College graduates, the company will offer Blue Dog Denim online in 22 standard sizes based on waist and inseam measurements.

Jesse Landa and her partners, Julia Lavanger and Kaylen Guzzi, formed the premium jean company this fall, and are in the process of finalizing designs and material. “Our main goal is to make a good-quality product that empowers women, and I hope we can influence how other companies size women’s clothing,” Landa says.
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