



CIRAS, IADG Testing New Way to Expand Industry in Iowa

A 40,000-square-foot building on a nine-acre industrial site in eastern Spencer, Iowa, has become the testing ground for a new initiative in rural economic development—with CIRAS playing a large role.

Spencer city manager Bob Fagen said the speculative building, part of a large, new industrial park that city leaders broke ground on in 2009, was constructed along a rail line with 35-foot-high walls because Spencer officials hoped it would prove attractive to a company making equipment for Iowa's growing wind and solar power industries.

Since construction, businesses from a variety of industries have shown glimmers of interest in the facility, Fagen said, although no purchaser has yet materialized. Now, Spencer officials and the people who helped them build the building in the first place have hit on a possible new way to woo an outside manufacturer to town.

"The idea is that when we market our building to 'ACME Corporation,' if that company says they're not sure this building will work, then we can say, 'Well, let us connect you with CIRAS at Iowa State University, and they can help us work through these challenges,'" said Kiley Miller, president and CEO of the Iowa Lakes Corridor Development

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On the Cover: IADG keeps the inside of speculative buildings hollow, so they can be quickly finished to the specifications of a particular tenant.

CIRAS Mission: *Every day we will enhance the performance of industry through applied research, education, and technical assistance.*

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Corporation, a regional economic development group that includes Spencer.

"Historically, we've referred business to CIRAS many times over the years, but always they were existing employers in the region," Miller said. "This is a new opportunity for us to use CIRAS as a business-attraction partner."

Spencer's building is one of 75 speculative industrial structures that have been constructed over the past 30 years under partnerships involving rural Iowa communities, their local utilities, and the Iowa Area Development Group (IADG). Sixty-five of those buildings—all but the most recently constructed—now belong to viable Iowa businesses, ranging from food processors to a tire company and a maker of medical devices.

"This is a common tool," said IADG president Rand Fisher. "It's simply one of our strategies that we use to grow industries in Iowa."

Founded in 1985, IADG works with rural utility companies in Iowa to invest in their communities in a variety of ways. The organization uses a special grant program from the U.S. Department of Agriculture (USDA) to provide seed money for rural development projects, including the speculative buildings. Local utilities, businesses, and/or governments typically finance construction costs, with assistance from IADG-obtained grants as the final piece.

"Research suggests that 80 percent or more of economic development projects start with a search for an existing facility. If a company wants to go somewhere, they want it to be as convenient as possible."

— Rand Fisher

"Research suggests that 80 percent or more of economic development projects start with a search for an existing facility," Fisher said. "If a company wants to go somewhere, they want it to be as convenient as possible."

In 2015, when IADG received a special national award from the USDA, federal officials credited the agency with using \$82 million in USDA grant money to leverage \$635 million of capital investment on more than 200 Iowa projects of

various types. Those projects led to the creation of 15,000 rural Iowa jobs and establishment of nearly 50 revolving loan funds for rural businesses and organizations to access across the state.

Fagen and Fisher describe speculative buildings as just another part of planning ahead for development in small-town Iowa. Spec or "shell" buildings generally are left unfinished, with dirt floors that can quickly be completed to whatever specification a new owner requires.

According to Fisher, IADG's sponsors have been involved in construction projects ranging from "10,000 to 50,000 square feet and larger" in a list of communities that includes Spirit Lake, Iowa Falls, Hampton, Harlan, and Mount Pleasant, among others.

"The aspirational goal of most of these communities when they build a spec building is to recruit an industry that could become an economic engine for their community," Fisher said.

CIRAS director Ron Cox said the initiative makes sense because IADG and its partners essentially are playing the role of investors and developers.



"The argument for it is that in large metropolitan areas, there's enough competition and enough companies coming and going that real estate people will speculate and build these buildings themselves—because they know that they're going to be able to rent them," Cox said. "In rural areas, there's not enough competition for the space, so fewer people want to risk building these."

Cox said CIRAS also sees broader possibilities in a pilot project involving the Spencer building.

CIRAS, which was created in 1963 as an outreach arm of the Iowa State University College of Engineering,

traditionally has focused most of its efforts on making existing businesses (and, by extension, their communities) function better, Cox said. CIRAS

currently offers a variety of programs designed to help Iowa companies boost growth, increase productivity, embrace new technology, and enhance their enterprise leadership.

The newly expanded relationship with IADG, Cox said, will allow CIRAS to broaden that role by assisting in the recruitment of new companies to Iowa and/or the expansion of existing Iowa companies.

"The argument for it is that in large metropolitan areas, there's enough competition and enough companies coming and going that real estate people will speculate and build these buildings themselves.... In rural areas, there's not enough competition for the space, so fewer people want to risk building these."

—Ron Cox

the vacant building during conversations with its industrial clients, as well as by helping educate potential purchasers about the Iowa resources available to help a company get up to speed faster. Additional CIRAS aid might or might not be added later to an economic incentive program for a potential purchaser, depending on that company's need.

Cox stressed that CIRAS will only be a part of deals that involve a firm that is new to Iowa or one looking to expand by adding a second facility. Helping a company move from one Iowa community to another would fall outside the center's mission, he said.

Fisher said he hopes IADG's new relationship with CIRAS will help educate more Iowa manufacturers that "there are options like this in their backyards."

Many details of the pilot project remain to be worked out. CIRAS will start by helping circulate word about

For more information about the Spencer building, contact Kiley Miller at kmiller@lakescorridor.com or 712-264-3474. To see a list of speculative buildings available across Iowa, visit <http://bit.ly/2hVHc1P> or call the IADG at 800-888-4743.



'MFG Day' Means Iowans Learning about Manufacturing

Thanks to CIRAS and its partners, more than 8,000 Iowans ended October with a greater appreciation for the people who make a living making things.

School children, parents, and community leaders attended a total of 149 events in October to commemorate National Manufacturing Day—an annual October 7 industry celebration that Iowa stretches into an entire month full of education.

This is the second year that CIRAS has worked with community colleges, Elevate Iowa, the Iowa Area Development Group, the Iowa Association of Business and Industry, and Iowa State University Extension and Outreach to fill October with "MFG Day" events in all 99 Iowa counties.

"This year, we definitely reached more people," said CIRAS account manager Paul Dunnwald. "Everything was bigger."

Events included a host of school visits (several by Iowa State University's solar-powered PrISUm car) and factory tours involving everyone from Cherokee Middle Schoolers to Governor Terry Branstad.

At Boone High School, science and engineering students heard a presentation on metal additive manufacturing—a cutting-edge form of 3D printing that promises to revolutionize product creation and design.

"I need more opportunities like this to let the kids see that what I'm saying is not

just a dog-and-pony show," said Boone teacher Shelly Vanyo. "They need to see that what they're learning, if they invest in it, can become a career."

After all the nationwide statistics are in, Iowa placed fourth in terms of the number of MFG Day events hosted—

behind Michigan's 215, Ohio's 187, and the 178 in California. "Per capita, we just smoked everybody," Dunnwald said.

"This year, we definitely reached more people. Everything was bigger."
— Paul Dunnwald

Iowa has roughly 6,110 manufacturing firms, including nearly 900 food factories. Combined, they add more than \$30 billion



Left: Students at East Mills School in Malvern examined Iowa State's Team PrISUm solar-powered car. **Above:** Chris Hill, (top) head of CIRAS' Technology Assistance Program, spoke to Boone High School students about metal 3D printing and (below) displayed 3D printed items.

annually to the state's economy and make up the second-largest portion of its gross domestic product. On average, Iowa manufacturing jobs pay 20 percent higher than other positions, yet surveys show that only 37 percent of Americans would encourage their children to go into manufacturing.

Organizers believe MFG Day events can help a skeptical public gain new appreciation for the professionalism of modern manufacturing. In Iowa, it seems to be working, Dunnwald said.

"Some of these Iowa companies may not look like much on the outside, but their capabilities are fantastic," he said. "And they're filled with good, hardworking people."

CIRAS staffers began planning the 2017 MFG Day in January.

› For more information or to suggest an event, contact Paul Dunnwald at dunnwald@iastate.edu or 515-509-1377.

New CIRAS Advisory Council Members

Mike Hilderbrand, president of Dalton Ag. Inc in Lenox, specializes in the manufacture and distribution of agricultural fertilizer application equipment. His expertise includes market research, strategic planning, operations management, and product development.

Hilderbrand holds a master of business administration from Keller Graduate School and a bachelor's degree from Southern Illinois University. He also has management certificates from Wichita State University and Harvard University.



Mike Hilderbrand

Janet Sparrow is cofounder and vice president of people at Milkhouse Candles, an Osage company that makes clean-burning candles from natural soy and pure beeswax. Milkhouse Candles started as a hobby in 2002. Sparrow spent 14 years as an occupational therapist before joining Milkhouse full time in 2014. In 2015, Milkhouse was named an Elite Business of the Year Finalist and received Iowa Farm Bureau's Renew Rural Iowa Entrepreneur Award. Sparrow has a master's degree in occupational therapy and a bachelor's degree in psychology, both from St. Ambrose University in Davenport, Iowa.



Janet Sparrow

William Zimmerle Jr., plant manager for Valent BioSciences Corporation in Osage, focuses on safety, efficiency, and sound environmental practices as he directs employee teams. He previously served as production manager for Advanced



William Zimmerle Jr.

Components Technologies in Northwood. Zimmerle has a master's degree in industrial technology and a bachelor's degree in biology from the University of Northern Iowa.

Deconstructing Recent Manufacturing GDP Growth in Iowa by Liesl Eathington

We have several ways to measure the recent performance of Iowa's manufacturing sector, including number of jobs gained or lost, millions of dollars of capital invested, or real change in gross domestic product (GDP). Sometimes referred to as "value added," GDP is the most comprehensive of these measures because it reflects productivity gains achieved by existing firms as well as changes in overall sector size.

From a competitive standpoint, looking at real change in manufacturing sector GDP tells us which states and regions are growing more rapidly than others, but it doesn't tell us why. Why, for example, is manufacturing GDP growing more rapidly in western states than in midwestern states like Iowa? To explore this, we can employ "competitive shift-share" analysis to deconstruct recent manufacturing GDP growth into three explanatory components: national growth, industry mix, and competitive share.

- The national growth component describes expected growth based on the overall performance of the U.S. manufacturing sector. If Iowa's manufacturing sector looked and behaved just like the U.S. manufacturing sector, it would have achieved real GDP growth of 0.4 percent each year during the last decade.
- The industry mix component accounts for differences in the industrial composition of a region's manufacturing portfolio. We would expect regions that specialize in rapidly growing U.S. industries to achieve higher overall rates of manufacturing GDP growth. Regions with manufacturing concentrations in industries that are growing more slowly or declining nationally are likely to post slower growth in manufacturing sector GDP. To illustrate, Iowa's manufacturing emphases in food and fabricated metals contribute negatively to its industrial mix component because U.S. growth in those subsectors has fallen short of the manufacturing average over the last decade. Iowa's overall industry mix component represented an annual drag of -0.4 percent on

real manufacturing GDP growth from 2004–2014.

- The competitive share component quantifies the performance of Iowa's own manufacturing firms relative to their subsector counterparts across the United States. For example, Iowa's food manufacturing GDP growth has lagged the U.S. food manufacturing average in the last decade, contributing negatively to the state's competitive share; whereas Iowa's chemical manufacturing GDP grew more rapidly than the U.S. chemicals average, contributing positively to the competitive share component. Iowa's subsectors combined for an overall competitive share contribution of 0.0 percent annual growth in manufacturing GDP.

Summing the national growth (0.4 percent), industry mix (-0.4 percent) and competitive share (0.0 percent) components yields Iowa's real manufacturing GDP growth of 0.0 percent per year from 2004 to 2014. Figure 1

illustrates Iowa's growth compared to other regions in the United States.

Iowa's manufacturing sector outperformed averages for states in the Mideast, New England, Southeast, and Great Lakes regions, but it fell short when compared to its own Plains region and states farther west. All of the eastern regions experienced real declines in total manufacturing sector GDP. A favorable industry mix and a strong competitive performance contributed to rapid growth in the three western regions.

Iowa's manufacturing portfolio is tilted toward many of the nation's slower-growing subsectors. This industry mix puts Iowa, other Plains states, and several other regions at a disadvantage in the short run, because rapid diversification into new industries is difficult to achieve at large scale. Iowa's manufacturing industries can compensate by seeking competitive advantages through innovation, automation, and other means.

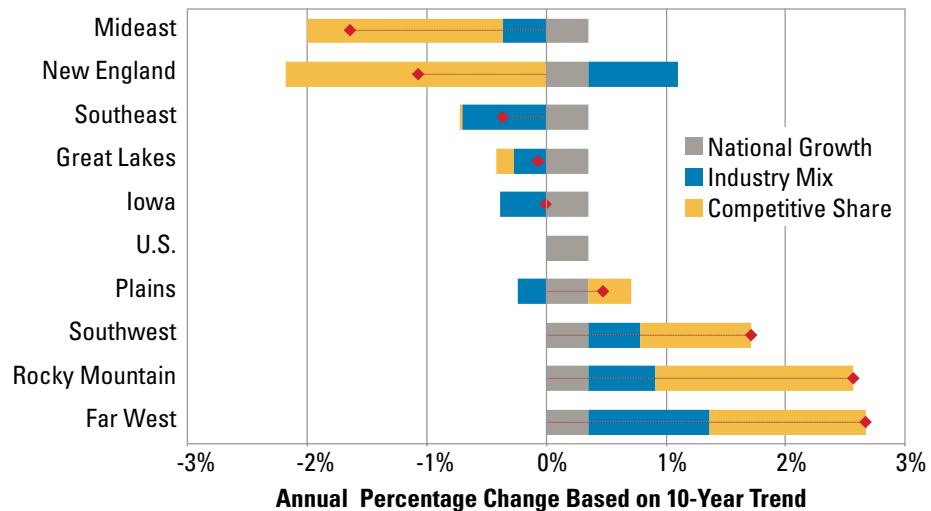


Figure 1: Competitive Analysis of Real Growth in Manufacturing GDP: 2004-14

Subcontracting: An Easier Path to Business with State and Local Governments

by Mary Zimmerman

If you're looking to do business with a city, county, or state agency in Iowa but you don't know how to approach it, then maybe you shouldn't—at least not head-on.

The answer instead could be subcontracting, which permits a business to participate in government contracting without dealing directly with the government. A subcontractor can gain experience from a prime contractor who already is familiar with the government's rules, regulations, and requirements—and he or she can do so without being responsible for managing the contract.

Many local government subcontracting opportunities fall under the construction sector, which accounts for almost 6 percent of Iowa's economy. Where do you find those opportunities? Start by locating a particular agency's website and reading its requirements. Most require you to register in their databases.

Once registered, potential bidders can be notified electronically of applicable bid opportunities. Companies can follow the bid links, peruse plans and specifications, and ask to be added to—or request a copy of—a plan-holders list, which is a list of prime contractors and subcontractors interested in bidding the project. This list will name each company and a contact person, phone number, and email address, thus enabling subs and primes to contact each other for consideration of each other's services.

Primes are always looking for good subcontractors. Finding the right one to partner with is key.

CIRAS' Procurement Technical Assistance Program (PTAP) recognizes the need for building networks and strategic alliances. CIRAS hosts three different annual Partnership and Networking events that focus on construction, professional services, and manufacturing. These events help businesses discover how partnering can increase their business opportunities, meet and identify potential partners, and boost their exposure across the state of Iowa.

Whether you are a prime contractor or a subcontractor, be sure to watch ciras.iastate.edu for the next Partnership and Networking events, which are held around the state and throughout the year.

Donlon Brothers Construction Finds Contracts Thanks to CIRAS Team

A five-year-old family construction company in northeast Iowa has secured its first government projects thanks to the support and teamwork of CIRAS staff members.

Donlon Brothers Construction, based in Elgin, works mostly in excavation, ranging from digging basements to creating ponds and terraces for farmers. The company hoped to expand its scope to include city, county, and state projects, Travis Donlon said. So he turned to CIRAS for help.

"It's nothing huge by any means, but it's a start."
—Travis Donlon

Donlon Brothers since has secured two subcontractor jobs, totaling \$103,305, tied to Iowa Department of Transportation (IDOT) bridge projects. "It's nothing huge by any means, but it's a start."

Donlon discovered CIRAS in early 2016 while researching opportunities through the Small Business Administration website. A call to CIRAS' West Des Moines office ultimately led him to a staffer in northeast Iowa. Then Donlon attended a May networking event in Coralville. He later worked with government contracting specialist Mary Zimmerman to understand IDOT's contracting process and prepare for a preconstruction meeting.

Donlon praised CIRAS staffers for answering his questions and finding the information he needed. "I tip my hat to CIRAS for that."

Zimmerman called the company's project a perfect example of how CIRAS staff around the state can coordinate and "connect the dots" to support companies. "You serve as a resource," she said. "You never know how it's going to turn out."

Donlon Brothers' success highlights the importance of building relationships, Zimmerman said. State and local government officials often make presentations at CIRAS networking events and are later available for questions.

"It's critical for potential future business to have good relationships with everyone you work with," Zimmerman said. "Word of mouth is very powerful."

For more information, contact Mary Zimmerman at maryz@iastate.edu or 515-450-1278.

AT A GLANCE

Donlon Brothers Construction

LOCATED: Elgin

FOUNDED: May 2011

EMPLOYEES: Three brothers and two additional family members; four part-time seasonal employees

IMPACT: Two subcontracting jobs totaling \$103,305

OVERVIEW: Construction company focused on excavation

IOWA STATE UNIVERSITY

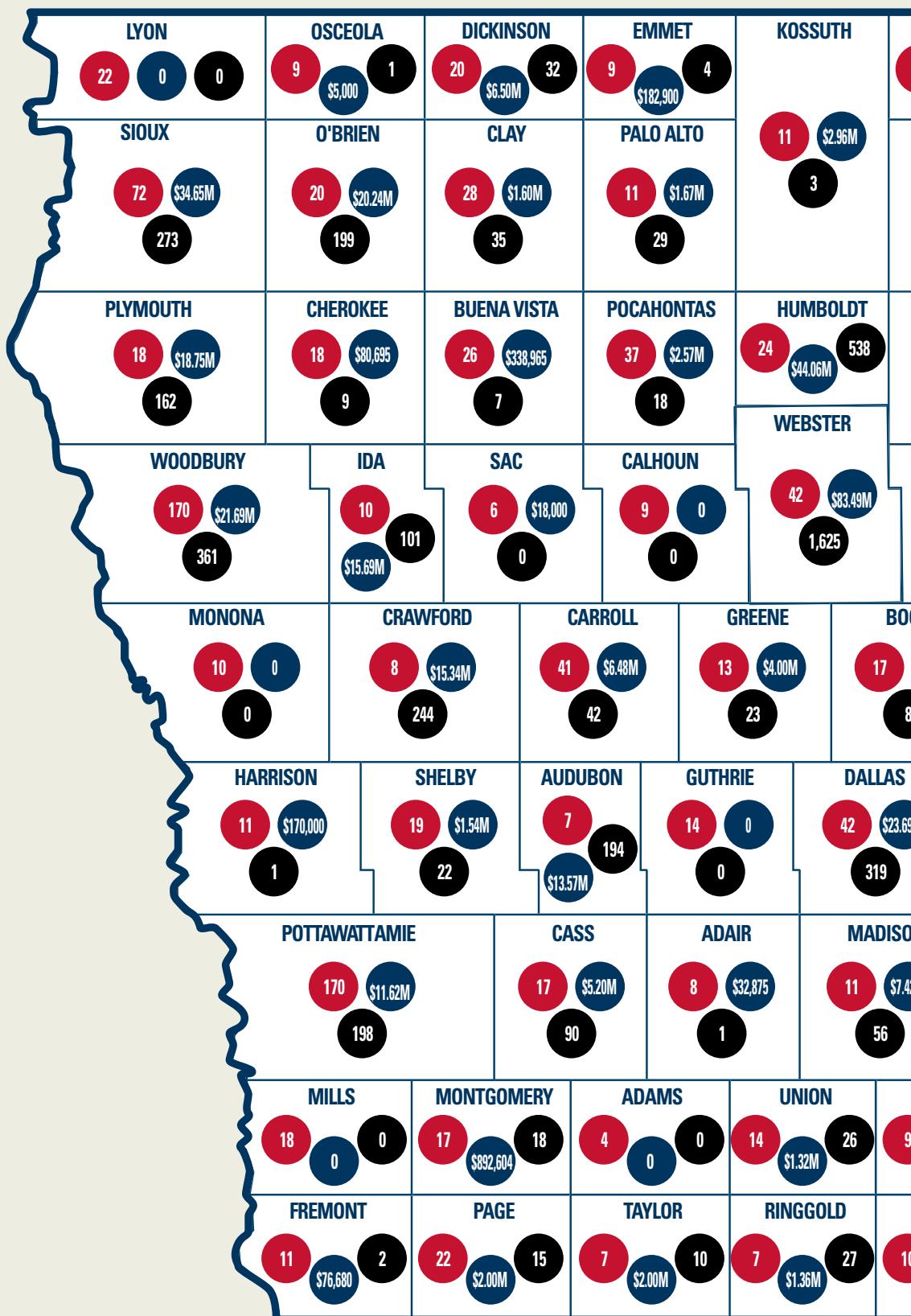
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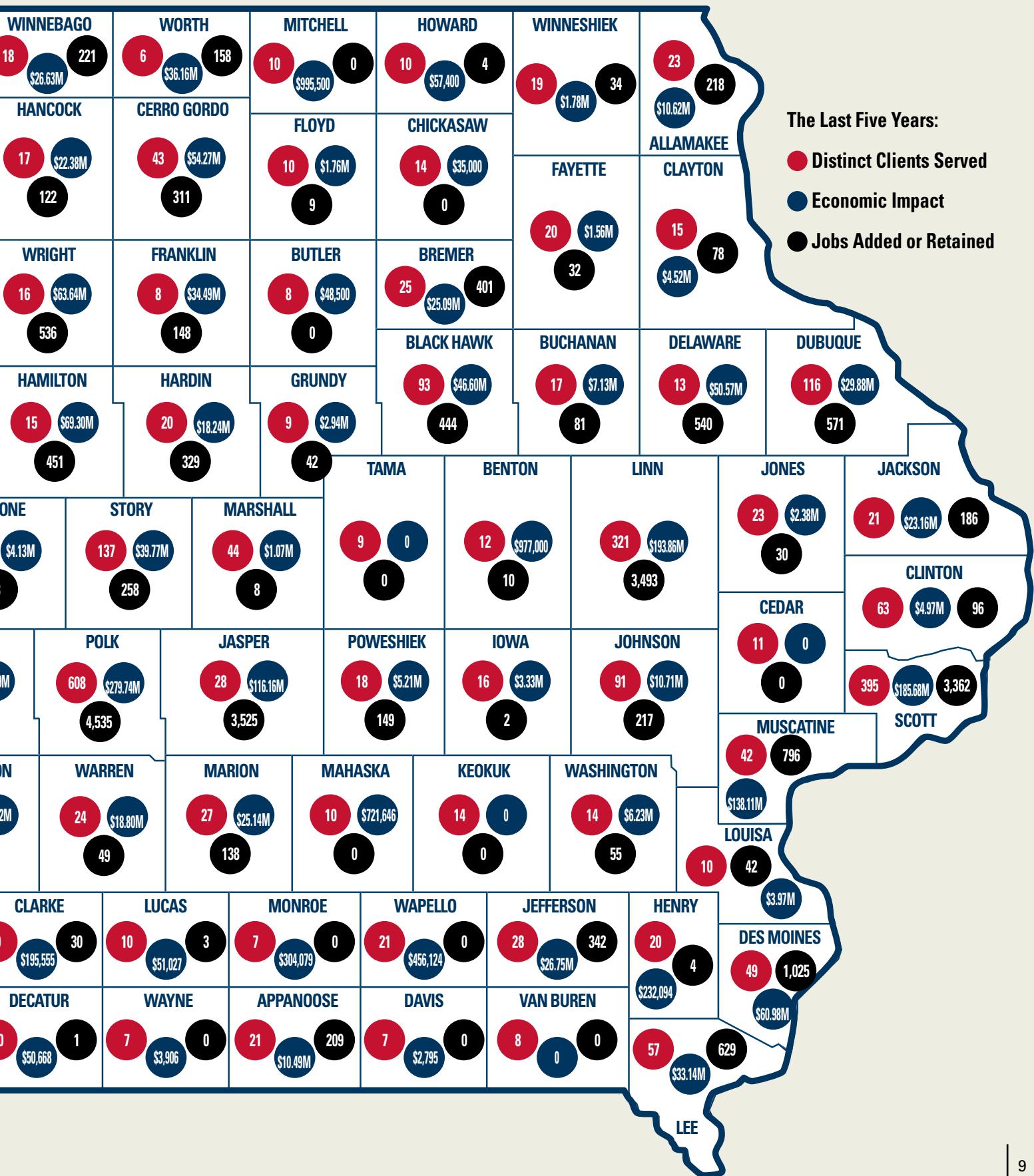
College of Engineering

Engaging, Educating, and Embedding— Everywhere

CIRAS and its partners provided assistance to 3,787 distinct Iowa businesses in calendar years 2011 through 2015. Clients reported an economic impact of more than \$2 billion during that period and estimated that 28,653 jobs either were created or retained because of CIRAS involvement.

In 2015 alone, CIRAS and its partners helped 1,561 Iowa businesses in 95 counties. According to company surveys, an estimated 5,400 jobs were added or retained because of work that had an estimated economic impact of \$424 million. The numbers include \$52 million in new investments, \$359 million in new or retained sales, and \$13 million in savings or avoided costs.







New EDM Will Help Students, CIRAS Additive Manufacturing Projects

Iowa State University students will gain even more valuable experience with manufacturing technology thanks to CIRAS' recent purchase of an electrical discharge machine (EDM).

The \$110,000 cutting tool was purchased with CIRAS funding and installed in December in a basement lab of Sukup Hall, only a few steps away from the metal additive manufacturing machine CIRAS purchased last year.

Chris Hill, head of CIRAS' Technology Assistance Program, said the new EDM will enhance CIRAS' ability to produce parts and fixtures on the metal additive machine. That machine, essentially a metal 3D printer, uses powdered metal and a laser to build complex items one 40-micron thick layer at a time. The finished projects then must be precisely cut from the metal plate used to support their construction.

EDMs use an electrically charged wire to cut through hard metal that otherwise would be difficult to machine.

"This will give us a lot faster turnaround time," Hill said. "We'll still be doing the same thing we were doing. But instead of sending it outside, we'll be able to walk 15 feet and get it done more quickly."

Joe Vanstrom, a lecturer in Iowa State's Department of Agriculture and Biosystems Engineering, said he plans to include the EDM in course discussions and show students the relative benefits of using it in comparison to other tools.

"We're always trying to get students more exposure to what they will see in the real world," Vanstrom said. "Being able to understand where and when to use that technology will help them become more efficient when they become professionals."



Above: Iowa State engineering student Emma Gallegos checks the status of a test project while being trained to operate CIRAS' new EDM, as Iowa State instructor Joe Vanstrom watches.

Below: CIRAS' new electrical discharge machine (EDM) will facilitate projects produced in CIRAS' metal additive manufacturing machine. It also will give Iowa State students broader experience with manufacturing technology.

➤ For more information on additive manufacturing, contact Chris Hill at chhill@iastate.edu or 515-313-8251.



Iowa State Career Fairs Let Companies, Students Share Stories

Hundreds of companies will again flock to the Iowa State University campus this spring for a twice-yearly ritual focused, on both sides of the handshakes, at quickly forging as many relationships as possible.

Ryan McSweeney, a senior majoring in chemical engineering, spent a full afternoon at last September's Engineering Career Fair methodically working down a list of companies he had previously researched. McSweeney stood in lines, chatted with recruiters, and occasionally retreated to the Hilton Coliseum seats to rest and regroup.

"It's a lot of stress when you're looking for a full-time job," he said. "You want to be able to start a conversation with them, to do a back-and-forth. You want to tell them a story."

Some recruiters had plans to interview on campus outside the career fair, McSweeney said. Some were promising phone calls down the road, or asking students to also apply online. But "everybody seems to be taking it seriously."

Nearby, chemical engineering major Lorena McGee sat and described a similar strategy. At mid-afternoon, she still had several more companies to meet.

"I'm going to be here until the end," she said. "But right now, my feet hurt."

September's Engineering Career Fair included a record number of companies. But Iowa State University stresses that corporate recruiters are welcome on campus at any time of the year, and companies are encouraged to set up their own events to meet with potential employees. Businesses interested in hosting a recruitment event through the College of Engineering may email ecs@iastate.edu.



"You want to be able to start a conversation with them, to do a back-and-forth. You want to tell them a story."

— Ryan McSweeney



"I'm going to be here until the end. But right now, my feet hurt."

— Lorena McGee

Spring Career Fairs

Here are the Iowa State University spring career fair dates and locations, along with contact information for employers interested in participating. Learn more at www.hs.iastate.edu/career-services/career-fairs.

Engineering Career Fair: Noon to 6 p.m. Tuesday, February 7, 2017, Hilton Coliseum and Scheman Building. Contact: ecs@iastate.edu.

Agriculture and Life Sciences Ag Career Day: 10 a.m. to 2 p.m. Wednesday, February 1, 2017, Memorial Union. Contact: mikegaul@iastate.edu.

Business, Industry, and Technology Career Fair: Noon to 6 p.m. Wednesday, February 8, 2017, Hilton Coliseum. Focuses on Business, Liberal Arts & Sciences, and Human Sciences. Contact: hscareers@iastate.edu; register through CyHire.

People to People Career Fair: 1 to 5 p.m. Wednesday, February 8, 2017, Scheman Building. Focuses on Human/Social Services, Education, Health/Wellness, Government, and Hospitality. Hosted by the Colleges of Human Sciences and Liberal Arts and Sciences. Contact: hscareers@iastate.edu.

Design Career Expo: Noon to 5 p.m. Thursday, March 2, 2017, Memorial Union. Contact: designcareers@iastate.edu.

Teacher Education Career Fair: 1 to 5 p.m. Monday, March 6, 2017, Iowa State Alumni Center. Contact: tecareerfair@iastate.edu; register through CyHire.



PyroGraphics Resets Its Future with a Little CIRAS Assistance

Everything seemed to be going great, Dan Svec recalls, until the first hints of a recession appeared and began to expose the weaknesses at PyroGraphics.

In 2008, the West Des Moines printing company, which specializes in business promotional items and souvenirs, was starting to struggle in a declining economy in which most promotion had stopped. By 2012, when the company discovered CIRAS, the end was very much in sight.

"Five years ago, we were a company that was just trying to survive—and that was really in serious question," said Svec, PyroGraphics' president. "Now, we're beginning to thrive."

PyroGraphics now has nearly double the 12 employees it had in 2012 and recently posted its fourth consecutive year of 10 percent revenue growth.

"I think it's been an unparalleled success," Svec said of the company's relationship with CIRAS. "The resources that CIRAS has brought to us are resources we would have a very difficult time accessing at a reasonable cost any other way."

Over the last four years, PyroGraphics has turned to CIRAS for help improving

its website and deciding which customers to target. But Svec traces much of the company's improvement to a "current reality tree" process that CIRAS used to map problems back to their root causes. CIRAS account manager Derek Thompson then helped coach the company about possible solutions.

Thompson describes CIRAS' involvement as helping PyroGraphics build a "business management structure." Thompson worked with the company to develop a scoring system for its customers so employees could prioritize the most profitable clients. And he encouraged PyroGraphics to schedule monthly staff meetings "so everybody is on the same page, and they can identify what they need to work on so they're more productive."

"It sounds pretty basic," Svec said. "But there are an awful lot of us out here who are entrepreneurs who have this good concept for a business but kind of struggle when the rubber meets the road."

Svec, who built special machines for PyroGraphics to allow the precision

adjustments necessary in printing multicolored logos on mugs and glassware, said the new structure has freed him to focus on larger issues—such as finding ways to be more efficient and working to diversify the company with new business. Among other additions, PyroGraphics now prints elaborate bottles for distilleries and small batches of cups for internet gift stores (higher margins) alongside the usual large orders for national promotional products distributors.

"Before, business just used to come to us," Svec said. "Now, we're proactively going out there and getting it."

AT A GLANCE

Pyrographics

LOCATED: West Des Moines

FOUNDED: 1994

EMPLOYEES: 20

IMPACT: Roughly \$482,000 in increased sales over the past five years.

OVERVIEW: Printer of glassware, mugs, and other items.

› For more information, contact Derek Thompson at thompson@iastate.edu or 515-419-2163.

Iowa State Capstone Students Find Companies Savings, New Efficiencies

Workers at a Des Moines maker of fuel and lubricant delivery trucks now have more efficient workstations thanks to ongoing ties to students at Iowa State University.

Seneca Tank previously had worked with capstone students from Iowa State's College of Engineering to find cost savings in the design of a new 45,000-square-foot production facility. S. J. Risewick, director of unit sales and production, said it was an easy decision to work with the students again.

"The college students were much more approachable than a consultant," Risewick said. "Our employees were much more engaged in educating them on our products and processes."

Seneca Tank employees previously worked out of a stationary tool box with more than 100 components, most of which were rarely used. During the fall 2015 semester, capstone students and Seneca Tank workers began to collaborate on designs for a mobile cart that instead housed the 20 to 30 most-needed tools. Beta testing on prototypes occurred in spring 2016, and Risewick said the final design has made employees' workdays much easier. "It's reduced the walking time tremendously."

Seniors in all eight academic departments of the College of Engineering are required to complete a "capstone" project before graduation.

"You apply what you've learned over the last three years to a real problem, an engineering problem," said CIRAS project manager Carey Novak, who helps match companies with students. "This isn't just something made up in a classroom; these are real-world problems."

Capstone projects provide students with valuable experience while helping Iowa companies create new products or streamline their business models. There were 115 projects completed last year, Novak said. For each of the last three years, companies involved in capstone projects have reported at least \$20 million in cost reductions and/or new or retained sales attributable to the projects.

In Humboldt, Liguria Foods is working with capstone students to automate the loading process for some products. Students created two proposals that combined elements of technology, food safety, and ergonomics. The final plan will semi-automate a process that is currently all manual labor.

Although the initiative is still a work in progress, company leaders expect to have it operational sometime in 2017, said Joe Christopherson, vice president of operations. The cost of the project will be recouped through savings and efficiencies within 12 months of its start date, he said.

Students' visits to the plant to observe the current process and take measurements also gave them a real-world window into Liguria's work, Christopherson said. "They were able to talk with not only members of management but the employees that were doing the work."

For more information about the capstone program, contact Carey Novak at cenovak@iastate.edu or 515-408-4257.

Look closely at Iowa State University's new Economic Development Core Facility (CIRAS' new home), and you will discover a wide variety of Iowa-made products. Iowa State sought to showcase a host of locally made products and services in building and stocking the new facility, which opened in mid-2016. Here are just a few of the companies involved in creating 1805 Collaboration Place in Ames, Iowa.

Schumacher Elevator Company

Overview: Schumacher Elevator is an engineered-to-order manufacturing company working with architects and contractors. They produce elevator equipment for wholesale customers worldwide, while their retail strategy installs and modernizes units in Iowa and surrounding states. The company's growing customer base currently utilizes 20 service locations and has recently completed major projects at all three state universities.

Location: Denver, Iowa

Founded: 1936

Employees: 213

Website: www.schumacherelevator.com



Story Construction

Overview: Story Construction has partnered with the ISU Research Park since its inception in 1989 and has been involved in nearly 40 projects there, including serving as contractor for the new ISU Economic Development Core Facility. Utilizing its Construction Production 2.0 (CP2.0) process, Story ensured that the project met the owner's requirements for schedule, budget, quality, and safety.



Location:

Ames, Iowa

Founded: 1934

Employees: 135

Website: www.storycon.com

Rada Mfg. Co.

Overview: Rada manufactures 100% "Made in the USA" kitchen knives and cooking utensils. Rada Cutlery is sold by thousands of fundraising groups each year to raise money for their schools, churches, teams, clubs, or youth groups. Rada's kitchen products are also sold by independent resellers at fairs, events, and farmers markets.

Location: Waverly, Iowa

Founded: 1948

Employees: 100

Website: www.RadaCutlery.com



CIRAS Food Industry Survey Shows Diversity, Interest in Improvement

The Iowa companies manufacturing human and animal food are mostly small firms with well-established histories. Despite that history, some appear to be ripe for large-scale change.

Nearly 200 respondents to a recent CIRAS survey of Iowa's Food & Beverage, Feed & Grain sector painted a diverse picture of this important manufacturing subgroup. Most respondents said they work at companies who have been in business for 25 years or more. Slightly more than half of the companies have fewer than 50 people, although one in six employ 250 people or more.

The survey targeted a broad range of product manufacturers, including bakeries, tortilla makers, and animal food producers, among others. The largest fraction of respondents, nearly 30 percent, fell in the 'Other Food Manufacturing' category, which includes items such as snack foods, desserts, and food ingredients.

More than 40 percent of respondents said their facility has some kind of research and development capability. Nearly half stated that 3 percent or more of their employees have a college degree in engineering or food technology. But fewer than 20 percent reported ever taking advantage of an R&D tax credit.

Among other findings:

- Respondents ranked processing technologies (finding new value from current product/materials), food safety (new shipping processes to increase shelf life, etc.), and niche markets (targeting consumers who desire vegan, gluten-free, etc.) as the technologies most likely to help grow sales.
- Automation, quality management systems, and improving food safety through sanitary design of equipment and shipping processes were ranked as the technologies most likely to help reduce costs.
- Nearly half of all companies have used an Iowa State resource to improve some aspect of their business.

With change in mind, Iowa's Food & Beverage, Feed & Grain manufacturers were invited to attend a CIRAS Innovation Summit in November. Nearly 70 participants heard presentations on automation, ultrasonic technology, internet marketing techniques, and the research resources available at Iowa State University.

CIRAS will spend the next few months helping individual companies embrace technologies that could improve their businesses.



Find the full survey results at <http://ow.ly/q6cm306AXJw>. For more information, contact Pete Nadolny at pnadolny@iastate.edu or 515-227-2471.

CIRAS Assessment Finds That Iowa Manufacturers Need Strategy, Technology Help

Iowa manufacturers need help developing strategies, exploring new markets, implementing proven ways of dealing with workforce constraints, and wielding technology as a competitive advantage.

Those are the findings from a recent CIRAS Needs Assessment based on a survey of more than 250 manufacturers.

In short, the survey found that one-quarter of Iowa manufacturers are doing well, with a reported return on sales of more than 15 percent. Three out of four manufacturers, however, reported margins much slimmer.

Other findings include the following:

- Iowa manufacturers see health care costs as the single largest, looming threat to their growth over the next few years.
- Despite complaints about a scarcity of workers, few Iowa companies have adopted proven techniques for managing that resource, such as embracing automation or lean manufacturing.
- There's a mismatch at many Iowa manufacturers between the stated strategy and what a company actually is doing. The survey found, for example, that only 62 percent of Iowa manufacturers with an innovation-first strategy have implemented 3D CAD and other similar tools that could help them prepare for the coming wave of manufacturing technology. Only 50 percent of self-described innovative companies have a formal process for bringing new ideas to market.
- Those manufacturing companies that have embraced 3D CAD and advanced engineering tools tend to worry less about their ability to cope with things like a perceived workforce shortage.

CIRAS is using the survey results as a blueprint for mapping our own strategy for the services we'll be providing in 2017. The year ahead includes, among other things, a focus on helping companies improve their implementation of productivity measures, helping them explore new opportunities in new markets, and assisting them in a leap toward digital manufacturing technology.

For details, see the complete version of the Needs Assessment at <https://t.co/Fr6NvzYpeS> or contact CIRAS program manager Mike O'Donnell at modonnll@iastate.edu.

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Since 1963, we have delivered proven services to enhance the performance of industry. Our approach—Engage. Educate. Embed.—creates specific solutions that allow each business and its community to prosper and grow. Coupled with a satisfaction guarantee, our typical client has achieved a 200% ROI. Clients have reported an economic impact of more than \$2 billion over the past five years.

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INNOVATION

Leveraging the Innovation Cycle: Definition

by Paul Gormley

For an idea to become an innovation, it must pass through the four phases of the innovation cycle: Definition, Discovery, Development, and Delivery. In this article, the first of those four phases, Definition, is discussed in greater detail.

Definition can be broken into four main elements: ideation, documentation, collection, and promotion. Each element plays a role in moving a spark of an idea to a solid concept that can be thoroughly examined for value.

Teams of people do not create ideas; individuals do. Research shows, however, that both expert innovators and novices can benefit from a team-based ideation system. An effective ideation system will typically start with a way to stimulate nontraditional thinking, which expands opportunities and provides a framework for teams to focus on potentially innovative ideas. Used appropriately, team diversity, associations, external stimuli, and even humor have been shown to generate more creative and innovative ideas.

Ideas become real when they can be communicated without their creator's assistance. Documentation is key. To effectively communicate an idea's value, you need to include several key elements, including target customer

and value proposition. By providing a documentation format that ensures the inclusion of those elements, the idea and its proposed value can be better understood.

A well-defined collection process for gathering and sharing ideas with key decision makers improves a company's ability to act. This can reduce frustration for those who invest time and energy early in the process and improve organizational buy-in of the innovation system.

Since no organization has unlimited resources, the promotion of a manageable number of ideas is necessary. Innovative companies are able to quickly elevate ideas with the most promise and move them to the next phase, Discovery. Understanding the capacity of the system and having a process to selectively commit resources will lead to better results.

Organizations that feel they could benefit from a more systematic approach to the Definition phase should start by examining their present approaches to ideation, documentation, collection, and promotion.

If you would like further information on how CIRAS can help you become more innovative, please contact CIRAS at 515-294-3420. To participate in the innovation discussion, join our LinkedIn group at [linkd.in/12tVLy1](https://www.linkedin.com/groups/12tVLy1).