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Fresh issues, new technologies highlight annual e-business conference

by Helen Randall, HKR Communications

Few can deny the impact of electronic communications technologies—the Internet, e-mail, networks, etc.—on their businesses, industries, and personal lives. Keeping up with the changes and new products brought about by this digital explosion, however, can be daunting. The second annual Midwest E-Business Conference, sponsored by CIRAS and a variety of its partners, once again diffused some of the mysteries.

Security, the need for change in people's thinking, and a look at the next wave in Internet change and challenges rose to the top of the list of current issues. These were explored in detail by main speakers at the three-day conference, held in September in Ames. In the past, businesses have relied on an "interruption-based" style of marketing, speaker Michael Wagner of Spindustries in Des Moines told the first-day audience. This includes meals interrupted by telemarketers, drives with billboards, television viewing by commercials, print articles with ads, and so forth. In all these instances, people found ways to reduce the intrusions—mute buttons, taped TV viewing, etc.

Internet marketing, he said, has introduced the new trend of "permission-based" marketing, which grows from the interactivity and supporting technologies of the Internet. The challenges to business are to create a desire to interact on the part of customers, create relationships with them, and give them increasingly competitive tools of engagement with the business. "Technology should advance the goals of a business. . . . I think we'd all be better off if we let this e-thing go away. Just call it business," said Wagner.

With this interactivity and engagement of clients and customers, however, come growing security

Senator Grassley speaks to conference participants

by Helen Randall, HKR Communications



Iowa Senator Chuck Grassley spoke to the participants of the Midwest E-business Conference on its final day, underscoring the impact of Internet technology on social, personal, and business fronts across the U.S. and the world.

The Internet has brought "limitless possibilities," he said.

Grassley identified several companies in small Iowa communities who have set up kiosks to do business around the world or can service retail orders from any community in the state and deliver products to different locations. More than 40 dot-com firms are located in Fairfield, Iowa, alone, and the State of Iowa Web site offers translations in multiple languages, he said.

The senator also offered the example of the Agricultural Marketing Resource Center at Iowa State University, which received a \$5-million USDA grant to establish an electronic-based agriculture information, service, and learning center to serve the agriculture industry nationwide.

This supportive effort, he added, not only will assist current producers but will help to attract younger generations that are more confident of using the Internet in the business of farming.

"The Internet," he said, "is very much in its infancy. In an historical perspective, it is in its bronze age. I like to say the 'stupid age' is over. The golden age is ahead." ■

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and associated entities, through education and technology-based services.

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Fresh issues, new technologies

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concerns. Uday O. Ali Pabrai of the efirst.com firm in Illinois, a noted expert in e-security who lists major banks and U.S. government departments among clients, addressed these concerns. Pabrai said the rapid move to e-business has brought about the challenge of knowing who is on the other side of the technology, and if you are making a transaction, how to be sure it is secure from attack by your competitor, the middle person, an outsider, or anyone else. "I'm convinced that in a few years only those businesses will be around who have made the transition from business to e-business," he explained.

What is going to keep these new lines of communications secure for businesses? Pabrai elaborated on several fronts: business program devices (PKI), legislative devices (requirements and laws), the advancement of biometrics, and so-called "smart cards." He noted that the security downtime for U.S. businesses in the last 12 months was estimated to cost \$273 billion. Security issues, he said, have moved from the information technology staff level in corporations to the top executive level. "It will become even more of an issue with nearly \$7 trillion in e-business transactions anticipated by 2004," he said. Biometrics and smart cards involving human physical identification factors, according to Pabrai, are the fastest growing modes of security that provide stronger authentication at less cost per unit than program devices.

Dave Eaton, founder of Rainier Technology of Minnesota, which lists some of the largest firms in the world as clients, gave a brief rundown on Internet landmarks in its nearly 25-year history. He then previewed the impact of one of the newest platforms, XML (extensible markup language). XML expands the idea that users communicate with a single Web site. It allows communication and activity among Web sites and with you, carrying out in logical sequence the transactions necessary to accomplish a whole task. It also allows access from any device and transitions various levels of programs operating within your company, your clients, and your suppliers to communicate without problems.

Eaton gave several examples of how XML can be used, including one that involves taking a business trip. Your server, for instance, has information about you. You ask it to set up all parts of the trip. Automatically, your electronic self finds reservations for travel, lodging, food, etc., and comes back to you with options. You confirm or change the options and the system makes the deals. You then receive a phone call via the system if there are any changes, such as a flight delay. This mode of operation ensures the security of your transactions since they are conducted from one site to all resources.

In addition, the conference offered detailed information and training along tracks of topics—how-to training in networks and Web arenas, hands-on training in software and other e-business tools, agency and institution outreach to help businesses, and success stories in e-business. Participants chose the level of e-business and Internet activity that best fit them and their business needs.

Along with CIRAS, hosts for the conference were the ISU colleges of business and engineering, ISU Extension, the Iowa Manufacturing Extension Partnership, the Iowa Procurement Outreach Center, the Iowa Small Business Development Center, and the North Central Regional Center for Rural Development. Sponsors for the event included UPC, Centripetal, New Horizons Computer Learning Centers, pfk e-business systems, inc., and the Principal Financial Group. ■

For information about this year's conference or plans for next year's conference contact Rudy Pruszko, Conference Coordinator, at rpruszko@iastate.edu or 1-800-728-7367.

Innovative technology finds initial footing at CIRAS

By Jeff Mohr, CIRAS, and Sunanda Vittal, Engineering Communications and Marketing



In a recent project with CombiSep, Inc., a start-up company in Ames that manufactures chemical instrumentation, the CIRAS product design and development team helped demonstrate that commercializing

innovative ideas is a question of finding the right resources at the right time.

It all began when Dr. Edward Yeung, scientist and program director of ISU's chemical and biological sciences program, was looking for ways to commercialize his latest innovation for conducting chemical compound analysis—a multiplexed, absorbance-based capillary electrophoresis instrument, the MCE 2000™. Yeung, along with four other individuals, founded CombiSep to develop, produce, and market this new product. Dr. Shelley Coldiron, co-founder and CEO, put together a team of expert scientists and directed efforts in the design and development of the MCE 2000™.

Coldiron contacted senior staff engineer, now retired, Don Eichner and discussed the possibility of working with CIRAS. As a result, Eichner and the rest of the CIRAS product development team and its student interns were contracted by CombiSep to begin working on an operational prototype of the MCE 2000™.

"Because of our partnership with CIRAS, we were able to bring the concept through a prototype stage and then to market quickly and efficiently," said Coldiron. The challenge for the CIRAS team was to take Yeung's new laboratory-proven technology through the different stages of the design process needed to manufacture a marketable instrument that produced repeatable and reproducible

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EDE and agricultural biosystems engineering offer new course

By Rebecca Sidler Kellogg, Engineering Distance Education

Engineering Distance Education (EDE) is partnering with the Department of Agricultural and Biosystems Engineering (ABE) to produce a new and stimulating course in crop harvesting dynamics for the Spring 2002 semester. This course is targeted to meet the practical needs identified by manufacturers of harvesting or harvest-related equipment and is designed especially for working professionals across a broad spectrum of the agricultural industry.

While the focus of the course is grain harvesting, a wide range of topics will be addressed including

- physical properties of grain, forage, fibers, and other harvested biological materials
- technological principles and practice
- performance analysis
- design of machinery systems for harvest
- environmental factors that affect drop quality and influence machine design and operation
- equipment design and test criteria
- physical principles involved in harvesting crops

In January 2001, Dr. Graeme Quick, leader of the power and machinery section in ABE, began working with EDE to develop this media-rich graduate-level course. Over a period of eight months, Dr. Quick collected, organized, and combined video material, photos, and other graphics to produce digital content that supports a visually rich, high-impact learning environment. Students will be immersed in real-world crop harvesting and explore related issues and implications. In addition to the

media-rich environment, students will take virtual field trips to places like the ISU Seed Sciences Center and locations in a number of developing countries. The course also draws upon the vast agricultural resources and heritage of Iowa State University, the first established land-grant university with a key outreach mission in agriculture and technology.

Dr. Quick has researched and taught this subject for many years and brings a wealth of experience and expertise to the classroom. He has traveled extensively, working on crop harvesting techniques and equipment used around the world. His unique perspective is woven into the course, providing a fresh approach to crop harvesting. Students will gain extensive knowledge and new ideas that they can put to work immediately. Crops covered include beans, trees, biomass, flowers, strawberries, peanuts, and potatoes, to name just a few.

The three-credit course will be delivered in a combination of asynchronous lectures via videotape or streaming video over the Internet including interactive discussion opportunities. Individual and team projects will be required.

For more information about this course or to find a complete list of courses offered by the College of Engineering for off-campus students, please refer to our Web site at www.ede.iastate.edu or call EDE at 1-800-854-1675.

New manufacturing systems modeling course

By Rebecca Sidler Kellogg, Engineering Distance Education

Manufacturing Systems Modeling, a course targeted towards a variety of industries, is being offered for the first time off-campus this spring. Although it focuses on manufacturing systems, such as assembly lines or service systems, the course will analyze other systems. For example, the banking industry has many systems that could easily be modeled and analyzed using the same approaches and software.

Students will learn to create systems models and correctly analyze data to make operational or design decisions pertaining to the system. They will learn modeling concepts, the process of conducting simulation studies, how simulation languages operate, how to build computer simulation models of systems, how to collect and analyze data, how to utilize the models to evaluate system performance, and how to make selections between design alternatives. Students will experiment with different simulation models and optimization techniques.

EDE will offer the course via the Internet using streaming video or by videotape. Students will use the ARENA simulation language for modeling the systems. ARENA is the latest implementation of the SIMAN simulation environment, a package strongly orientated towards manufacturing simulation. A student copy of ARENA is included with the required text, *Simulation with Arena*, 2nd edition, by Kelton, Sadowski, and Sadowski.

For more information about the course and to register, visit the site at www.ede.iastate.edu or contact Professor Doug Gemmill, Industrial and Manufacturing Systems Engineering, 515-294-8731.

Understanding and operating under DPAS guidelines

By Kathy Bryan, Iowa Procurement Outreach Center

In response to production-related scheduling problems encountered at contractors' plants during World War II, Congress enacted the Defense Production Act of 1950. Title I gives the President the authority to require contracts in support of national defense to be accepted and performed on a preferential priority basis over all other contracts, including commercial work.

The Department of Commerce (DOC) is responsible for administering the Defense Priorities and Allocation System (DPAS) program. It is recognized for its placement of ratings, "DX" and "DO," on all orders for supplies and services under the control of the DOC. All contracts and orders, with the exception of those few programs cited by the President as having key political, scientific, or military objectives, are rated "DO." The remaining limited number of programs carry a "DX" rating.

DPAS is essentially a scheduling tool provided to contractors that allows queuing of all defense contracts in relation to commercial work while maintaining national defense priority for delivery. This policy essentially keeps an aggressive expeditor from another branch of service from convincing a contractor to push one order ahead of another on the production line. Similar prohibitions apply to private industry

that pay the contractor a premium to produce commercial work ahead of a rated Department of Defense contract.

Understanding DPAS is a key to successfully expediting production on contracts. DPAS is a tool that can be used by contracting officers, contract administrators, or weapons managers when a lack of contracted components has or ultimately will result in loss of or reduced mission capability. The DPAS officer works with contracting and operations directorates to ensure that contractor priority is maintained and special priorities assistance is requested when necessary.

All government contractors or those considering the government contracting market should pay close attention to the priority rating of the items they bid.

Contact the Iowa Procurement Outreach Center at 1-800-458-4465 for help and information when a priority rating has been used on a solicitation that you are interested in answering.

Government procurement opportunities

As of January 1, 2002, FedBizOpps (<http://www.fedbizopps.gov>) will be the official source for notices of solicitations for government procurements over \$25,000 that are currently being published in the Commerce Business Daily (CBD). The details are in the May 16, 2001, Federal Register.

The transition to FedBizOpps by government agencies was completed on October 1, 2001. After January 1, 2002, agencies will no longer be required to provide notice in the CBD. (From October through December, however, a notice will appear in BOTH FedBizOpps and the CBD.)

The new rule also involves the following:

- Place of contract performance and set-aside status will be required in the notice content.
- Agencies are required to make accessible other notices that are currently published in the CBD, such as pre-solicitation notices and award notices supporting subcontracting opportunities.
- Agencies are required to make accessible most solicitations and amendments associated with business opportunities listed on the FedBizOpps Web site.
- Contractors are permitted to publicize subcontracting opportunities with the intent of supporting achievement of subcontracting goals.
- Agencies will be permitted to make accessible information allowing potential offerors to better understand how they can meet the government's needs.

For information or assistance with FedBizOpps, contact Kathy Bryan or Bruce Coney at 1-800-458-4465.

Small business workshops

Small businesses play a vital role in Iowa's economy. To encourage the growth of these businesses, these daylong workshops sponsored by Small Business Development Centers (SBDC) and IPOC/CIRAS in cooperation with the U.S. Small Business Administration (SBA) give business owners and potential business owners all the tools they need to be successful. Following are the dates and locations for future workshops:

January 17, 2002 - Des Moines SBDC

March 21, 2002 - Davenport SBDC

June 20, 2002 - Creston SBDC

For more information on upcoming events, contact Kathy Bryan at 1-800-458-4465.

Breakfast, Business & More

Taking the time to meet other entrepreneurs can lead to new partnerships benefiting both you and your company. The Breakfast, Business & More events provide an excellent opportunity for entrepreneurs to meet other business owners, corporate buyers, and new clients. This event also opens up avenues to meet federal and state area representatives and visit with local business service programs that can assist in business growth.

December 13, 2001 – Cedar Falls – ISU Industry Outreach Center (dhines@ciras.iastate.edu or call 1-319-266-3260 for reservations)

January 10, 2002 – Des Moines Holiday Inn (kbryan@ciras.iastate.edu or call 1-800-458-4465 for reservations)

Small food vendors can strike big deals *by Helen Randall, HKR Communications*

In the agricultural heartland, it may seem like there would be built-in demand and large markets among major institutions for what is grown or processed locally—vegetables, fruits, meat, etc.

According to Gale Secor, purchasing coordinator for the Department of Residence at the University of Northern Iowa (UNI), that kind of production-purchasing link can be made, but it takes real effort on the part of producers. They need to gain insight into buying methods of institutions and businesses and make a commitment to meet their needs.

Secor cited the example of UNI's past purchasing tie with a small Iowa locker. The owner bid his meat like everyone else and had excellent quality. His niche, she said, was accommodating the needs of the university by providing a special cut of fresh, not frozen, meats. The dilemma on the part of the owner, however, was that with the extra work involved, could he bid it low enough to make a profit? Many smaller producers and processors face similar problems, she noted.

In August 2000, UNI cut down on some of that deal-by-deal work by going with a "prime vendor," a vendor who contracts with the university to find the best deals for the bulk of food used. Many large food purchasers operate this way. UNI purchases a tremendous volume of food to feed students, visitors, faculty, and staff. During the regular academic year, the various UNI food resources serve 8,000 meals daily. In preparation of food alone, 56 staff persons and 750 students are employed.

But the prime vendor contract has not cut out the idea of procuring food products through smaller, local producers



Erica Grim, an elementary education junior at UNI, works in the university's food services.

to which Secor said a percentage of business is available. "We still do some business with local farmers and producers," according to Secor. This is especially true in the summer when produce like strawberries, tomatoes, etc., is available in great quantity.

A professor at UNI is working with local farmers who produce and sell products, much like a local farmers' market, but on a larger scale. The process has been refined so that a staff person collects information from farmers about what is available and when, then reports prices and volumes. These prices are compared to other vendors and purchases are made from the low bidder.

"It's like two different worlds, trying to merge the two

Continued on page 10

Sullivan wins NAMTAC award *By Jennifer Maher, CIRAS, and Tim Sullivan, CIRAS*



Tim Sullivan, CIRAS, was a winner of the National Association of Management and Technical Assistance Centers' 2001 Outstanding Projects of the Year awards competition in the business assistance category. The NAMTAC annual fall conference in Tucson, Arizona, in mid-October was postponed, so the formal presentation of the award will be made in April 2002.

Sullivan won this award for developing a theory of constraints (TOC) program to assist Iowa manufacturers. This three-phase program offered public workshops on awareness and decision-making, on-site company education in TOC principles for staff members, and in-plant direct implementation assistance.

What's the objective of the TOC program?

TOC has one primary objective—to help a company make money now and in the future. To attain this goal, TOC helps companies assess their current reality, identify the necessary changes, and facilitate the process of focused, continuous improvement.

The process usually starts by challenging the way managers think when they make the decisions that drive their companies. This is where the workshops come in. Participants in these workshops have the opportunity to make decisions in simulated manufacturing environments and compare the results from a "local" perspective to those made from the "global" perspective. The fundamental principles of TOC are explained and demonstrated through these simple but effective hands-on simulations.

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CIRAS 2001 ANNUAL REPORT

University Extension

IOWA STATE UNIVERSITY

College of Engineering

CIRAS Mission Statement: *The mission of CIRAS is to enhance the performance of Iowa industry, and associated entities, through education and technology-based services.*

From the Director

This past year has been one of change and opportunity for CIRAS. Changes in staffing, programming, and the manufacturing economy have created opportunities for CIRAS to expand services and to create new partnerships to provide the latest programming requested by Iowa industry.

Grants have allowed us to expand our services, both with targeted one-on-one assistance and with cluster activities. This includes expanding technical services to rural Iowa through EDA's University Center grant, government procurement assistance to businesses through the Department of Defense and the Iowa Department of Economic Development (IDED) grants, and energy efficiency assistance through Department of Energy, Iowa Department of Natural Resources, and Iowa Energy Center funding of the Industries of the Future program.

Student assistance with client activities continued to grow. The 33 students who worked at CIRAS and Engineering Distance Education (EDE) this past year provided economical solutions to manufacturers' problems and also gained invaluable experience.

Partnering and leveraging resources has become a prerequisite for success in all CIRAS undertakings. In the past year, CIRAS staff have partnered with nearly 40 different community colleges, universities, state and federal agencies, and ISU departments and centers to continue to provide a broad range of programs, depth of knowledge, and efficiency of operation that our clients demand. CIRAS partnered with the Iowa Manufacturing Extension Partnership (Iowa MEP) to bring lean manufacturing to Iowa manufacturers. We also teamed with a number of community colleges and IDIED on numerous training projects. The Center for Advanced Technology Development (CATD) and the Iowa Company Assistance Program (ICAP) at ISU are key partners in our product design projects. Work with the Value-Added Agriculture group at ISU on quality systems is a developing program that holds great promise for improving the quality of food systems.

We continued to explore innovative ways to bring the latest manufacturing best practices to Iowa industry. The Cedar Falls Industry Outreach Center increased programming by 350% over FY00 levels, our partnership with EDE continued to grow as we developed non-credit engineering short courses, and we explored new opportunities with the Iowa MEP. Examples of our many successes are highlighted on the back.

For nearly four decades, CIRAS has brought research-based knowledge to bear on the critical needs of Iowa's manufacturers. In the future, we will continue to focus our efforts on these core needs and will also assist Iowa industry in transforming into the new economy industries that will be critical to the economic vitality of our state. As the new director of CIRAS, I am honored to be a part of this rich tradition of providing solutions to Iowa manufacturers.

Ronald A. Cox
Ronald A. Cox

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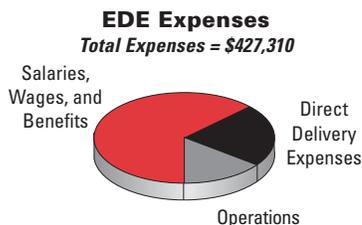
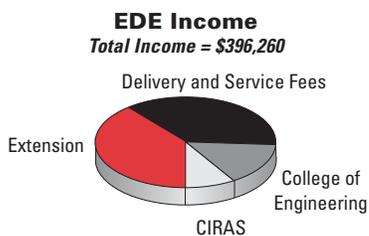
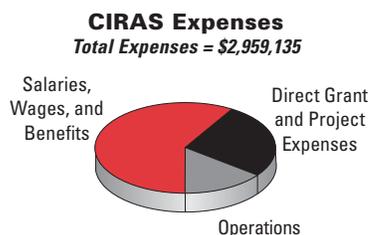
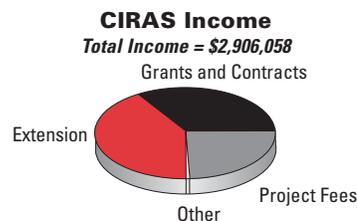
Engineering Distance Education

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- Hiro Iino
- Paul Jewell
- Rebecca Sidler Kellogg
- Joe Monahan
- Pam Skill

*As of June 30, 2001

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Iowa Manufacturing Profile

Iowa is home to 6,495 manufacturing facilities. The three areas below reflect how the manufacturing sector plays out as a portion of the state's total economic activity:

Labor Force	17%
Work Earnings	20%
Gross State Product	22%

2000-2001 Highlights

Business Planning and Management

- CIRAS assisted Carousel Farms Meats to develop a “virtual marketing” strategy in adopting information technology tools to boost sales and ensure future growth and productivity.
- Over 250 individuals attended the first annual E-business conference. “This conference has been a great overview tool for me—a great resource,” said Stewart Fluent, a partner in RADEC Engineering Services.
- A CIRAS team of industry experts, accountants, and business planners collaborated to compile the first comprehensive business start-up manual to aid Iowa livestock producers. *Adding Value to Pork Production*, a how-to manual for value-added pork production, is now available through CIRAS and ISU Extension offices.
- CIRAS’ national reputation for doing feasibility studies in recent years led to its prominence as a third-party consultant to the USDA Rural Development Agency.

Energy

- CIRAS moved forward with the Iowa Industries of the Future (IOF), an initiative that focuses on energy efficiency, waste reduction, and productivity improvements in the most energy intensive industry sectors. Metal casters participated in vision and roadmap sessions; representatives from ag producer groups, processors, and researchers began planning for the Agriculture IOF, which focuses on bio-based products.

Engineering Distance Education

- Over 350 Iowans working in a variety of industries enrolled in engineering distance education courses, up 19% from the previous year.
- The number of distance master’s degrees awarded increased by 30% over FY 2000.
- EDE helped deliver distance education engineering courses to 20 secondary school teachers across Iowa.

Government Procurement

- “They open doors for us,” said Tommy Young, Owner, Braunn-Young’s Sales and Marketing. CIRAS and IPOC have been instrumental in helping Braunn-Young’s obtain federal contracts and meet key players in industry.
- “IPOC is there for all small businesses and remains an invaluable resource for the everyday operations of Carver Pump Company,” said Jeanette Billingsley, after-market sales manager. Carver is a leading manufacturer and supplier of centrifugal pumps for industrial and marine markets.

Product Design and Testing

- Working with the Structural Engineering Lab at ISU, CIRAS assisted Sukup Manufacturing conduct on-site structural testing of its stacked grain dryers.
- In a project with Schaeff, Inc., CIRAS partnered with ISU’s mechanical engineering faculty and the Center for Non-Destructive Evaluation to evaluate and offer design alternatives for components used in Schaeff’s stand-up fork lifts.

- CIRAS and ISU’s aerospace engineering faculty assisted LPR Inc., a new company in Grinnell, Iowa, with product design and documentation for its exterior post-mounted sign. With CIRAS assistance, LPR has firmly established itself as an expanding company with first-year expected sales of \$500,000.
- CIRAS assisted CombiSep, Inc., in designing and developing a prototype based on an innovative technology developed by the ISU chemistry department and licensed to CombiSep through the ISU Research Foundation. The project exemplified CIRAS’ ability to partner with ISU resources, such as IMEP, CATD, Ames Lab, ICAP, and the AEEM department. “Because of our partnership with CIRAS, we were able to bring the concept through a prototype stage and then to market quickly and efficiently,” said President and CEO Dr. Shelley Coldiron.

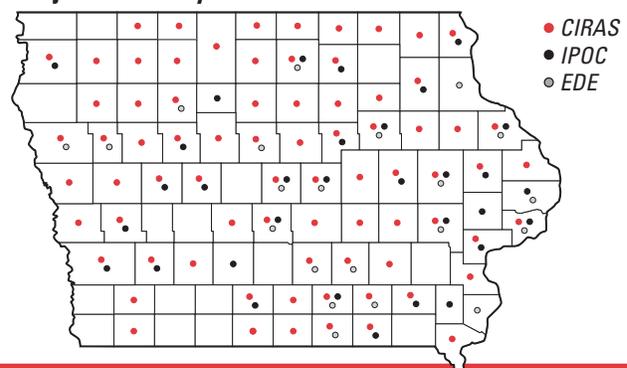
Productivity

- CIRAS specialists worked on a lean strategic plan with Paragon International, transforming it from a traditional ‘push’ to a lean ‘pull’ manufacturer. Sales per employee increased 27% and WIP decreased by 33%.
- Tim Sullivan received an Outstanding Project Award from the National Association of Management and Technical Assistance Centers for his work with Iowa manufacturers on Theory of Constraints.
- Iowa Fittings, an industrial welded steel fittings manufacturing company, experienced significant cost-savings in a project with CIRAS and Iowa Western Community College. Using an advanced computer simulation program, CIRAS helped the company assess the economics of expanding as well as ways to improve existing facilities. “The material handling process began to lend itself to a better flow, bringing in a savings of \$45,000,” reported Iowa Fittings.

Quality

- CIRAS initiated ISO 9001 implementation projects with two feed mills, a large grain farmer, and the ISU-NICC Dairy Center. Additionally, CIRAS trained a group of 35 farmers in basic ISO 9000 techniques.
- CIRAS worked with the Iowa Quality Center to develop a concept and implementation process for the Iowa Recognition for Performance Excellence Award, Iowa’s equivalent of the Malcolm Baldrige Award.

Project Activity



Helping industries meet their transportation needs

By Marcia Brinks, CTRE

Quality products, first-rate staff, and a strong business plan will help an industry succeed—but only if it can move its products and supplies efficiently. Now CIRAS is partnering with Iowa State University's Center for Transportation Research and Education (CTRE) to provide technical assistance to Iowa industries with transportation-related challenges, which may include the following:

- planning business and community land use
- facilitating transportation-related cooperation between industry and local or state governments
- enhancing plant layout and property access
- applying geographic information systems tools to enhance transport of goods
- accessing air transportation from rural areas
- working with distribution centers
- enhancing safety during the transport of hazardous materials
- training staff on logistics and other transportation-related issues

CTRE's mission is to provide technology transfer information and services to Iowa's public transportation agencies. Through Iowa State's Extension to Communities, CTRE is expanding its services to Iowa's businesses and communities.

Recent projects have included

- managing ingress and egress at Stellar Industries' Garner plant
- working with Hubbard businesses and high-school students to develop plans for rebuilding the district and maintaining the community's economic vitality after an explosion crippled its downtown district
- providing advice to Mason City on managing access and turning lanes along Iowa 122, where several businesses are located
- assisting Mediapolis in developing a gateway intersection design concept in harmony with a proposed downtown concept
- planning transportation connections from Sac City to relocated U.S. 20

In addition to providing technical assistance and advice, CTRE develops and conducts a variety of transportation-related training events. Whenever possible, CTRE takes its training programs to the field, conducting workshops in shops or offices.

CTRE's in-house training facilities are available to its partners and clients for reasonable fees. The facilities include a 40-student computer training laboratory and a separate video conference classroom.

CTRE is conveniently located off campus in Iowa State University's Research Park. 

Industries interested in taking advantage of CTRE's advising and training services or its training facilities should contact John Van Engelenhoven, industrial specialist at CIRAS (Newton office), at 1-641-791-0765 or jvc@iastate.edu, or Duane Smith, associate director for outreach at CTRE, at 1-515-294-8103 or desmith@iastate.edu.

Quick facts about CTRE

Focus: Transportation-related research, educational activities, and statewide training

Established: 1983

Staff: 30 full-time professional and academic staff; 30–40 graduate and undergraduate students

Areas of expertise:

- GIS, remote sensing, and information systems for transportation
- traffic engineering and safety
- transportation policy and planning
- asset/pavement management
- advanced transportation technologies
- pavements, bridges, and structures

Programs:

- Iowa Local Technical Assistance Program
- Iowa Traffic Safety Data Service
- Iowa Pavement Management Program
- Midwest Transportation Consortium (focusing on transportation asset management)
- Center for Portland Cement Concrete Pavement Technology
- Bridge Engineering Center

Center for Transportation Research and Education

Iowa State University Research Park
2901 South Loop Drive, Suite 3100
Ames, Iowa 50010-8632

1-515-294-8103

www.ctre.iastate.edu/



**Center for Transportation
Research and Education**

Innovative technology

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data. This included concept development and the modeling of these concepts using computer-aided design (CAD) software to arrive at preliminary designs made up of 3-D CAD models. During this phase of the development, the CIRAS team also utilized rapid prototyping technology. This technology takes a 3-D, CAD model's digital file and transforms it into a physical model that can then be used to verify form, fit, and function.

Once the preliminary design was finalized, materials and purchased components were specified and detailed drawings were created to fabricate the necessary parts. The majority of the parts used to build the prototypes were fabricated at the Department of Energy Ames Laboratory machine shop on campus. The CIRAS team assembled the prototype units, while the Ames Lab electronics shop added the wiring and electrical components. When the units were completed, CombiSep scientists ran tests, collected data, and evaluated results.

Throughout the entire project, CIRAS and CombiSep personnel worked as a team. Communication was essential for the successful completion of a project of this size and scope. To this end, weekly meetings were held between CombiSep and CIRAS personnel while daily communication was the norm as deadlines approached.

The CombiSep project demonstrated two aspects that characterize many of the CIRAS fee-for-service undertakings:

- First, through its contacts on and off-campus, CIRAS is able to successfully bring together resources to complete a project of this size. In the case of the MCE 2000™ development, essential contributors included the Iowa Manufacturing Extension Partnership (IMEP), the Center for Advanced Technology Development (CATD), the Iowa Companies Assistance Program (ICAP), the Institute for Physical Research and Technology (IPRT), and the Ames Laboratory. Within Ames Lab, the machine and the electronics shops of the Engineering Services Group were utilized.
- A second factor, integral to CIRAS services, is student involvement. CIRAS is an authorized intern and co-op site for ISU's College of Engineering. In the CombiSep project students contributed 6,500 hours over a 17-month period. "This particular project was special because the students got to design, construct, and then learn how to adjust to changes as needed. They were also involved in follow-up and modifications. The students received a full range of experience from initial meetings with the client and writing a proposal to dealing with vendors and the client on a regular basis," said Steve Devlin, CIRAS team member. 

The MCE 2000™ earned an R&D 100 Award for Ed Yeung, Distinguished Professor of Chemistry at ISU, and graduate student Xiaoyi Gong. The MCE 2000™ rapidly separates, detects, monitors, and quantifies chemical or biochemical compounds in 96 independent samples compared to conventional instruments that look at one sample at a time. Its potential applications are in the field of pharmaceutical, genomic, forensics, combinatorial chemistry, quality control, and early disease detection.

UNI Food

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(large volume needs and small producers). You need to have all this communication and figure out what makes it worth your while, vendor and purchaser alike," Secor explained.

The bottom line for those wishing to sell products to institutions like universities, hospitals, schools, business food services, and the like, she said, is that the producers need to explore the markets. Ask questions, listen, and possibly alter production plans to meet needs if a deal can be struck. Factors to consider besides ability to meet volume include transportation and refrigeration.

Secor offers the following advice for producers and processors wanting to do business with large purchasing units:

- Investigate entities with which you want to do business. Schedule an appointment to visit about your product and the client's needs. "I would hope you would be received well by the food purchasing staff," added Secor. Define needs. When making visits, take along samples of the product. UNI, she said, has been flexible and made adjustments for advantages of taste and price. It takes a little extra effort.
- Be sure your business is using all of the standard business equipment. Secor said it is difficult to work with businesses that have no fax capability, answering machine, computer, or e-mail service. "I think you will be losing business if you don't have some of the basic technologies in place." Businesses need to be able to respond quickly and have written documentation.
- Be ready to say what you want to do and to explain your company and product. Be precise. Have a little bit of history available—some written materials with lists of items available and when they are available. Use good marketing principles or use the advice of consultants.
- Understand the differences of doing business with a big corporation. Payment time frames, for example, can be longer, said Secor. Other differences are the sizes, flexibility, and users/clients of foods of the different institutions and businesses.
- Check out dependability of the deal. For example, a processor should check out stability of the business deal into the future before expending resources on new equipment. 

"We work with Iowa producers of different sizes with varied products to help them find markets and contracts for their products," said Bruce Coney, director of the Iowa Procurement Outreach Center (IPOC) at CIRAS. "Those who are interested in checking out institutional and state and government purchasing possibilities for their food or food processed items can call me or Kathy Bryan at 1-800-458-4465 or contact us by e-mail at IPOC@ciras.iastate.edu."

What can this program do for Iowa companies? A Case Study

Midwest Industries produces high-quality recreational products, including boat trailers and hoists, boat docks, trailers for personal watercraft and snowmobiles, and general-purpose utility trailers. In September 1998, a member of the Midwest Industries' management team attended a public workshop. Based on his initial exposure at this public session and subsequent participation with other management team members in a satellite series hosted by CIRAS with Dr. Eli Goldratt, the originator of the TOC concept, the president of Midwest Industries decided to implement TOC. Sullivan and an ISU faculty member conducted a three-day assessment and planning session. At this time Midwest made a decision to first implement a production control TOC solution since management felt that the company was not handling bottlenecks effectively, especially in the peak season.

A twenty-member cross-functional implementation team known as the TIGERS (Team for Implementation Guidance, Education, Reporting, and Sustaining enthusiasm) was formed to lead the effort. This leadership team consisted of persons who acted as resources to the work teams and several work-team members. A "drum-buffer-rope" seminar to teach the basics of TOC to the implementation team was presented on-site. Training was also conducted on the specifics of implementing a production solution. Team members then took part in mini training sessions for all employees.

Sullivan provided on-site assistance to the company for several months while working with the implementation team, which met six times during the process. The final production audit was conducted in April 2000.

What were the benefits for Midwest Industries?

Based on its April 2000 audit, the company has

- used TOC tools and principles to facilitate change within their existing team-oriented culture
- achieved a 10-percent increase in throughput
- decreased work-in-process inventory by 33 percent
- applied TOC reality tree principles and concepts with their suppliers to resolve issues
- decided to engage a full-time TOC consulting firm to continue its enterprise-wide implementation

Since September 1995, workshops such as those that first introduced Midwest Industries to TOC have been conducted a total of 59 times—28 for the public and 31 times as a dedicated in-house offering. Over 1,320 individuals from over 295 Iowa companies have participated in some aspect of this program. ■

For more information on TOC, contact Tim Sullivan at 1-515-727-0656 or tsullivan@ciras.iastate.edu.

CIRAS, IPRT team solve quality problem *By IPRT*

CIRAS and ISU's Institute for Physical Research and Technology (IPRT) worked together to solve a quality problem for Kiowa Corporation. The Marshalltown company was founded in 1927 and today supplies die castings and finished parts for a range of products, including automobiles, farm and construction equipment, and computer peripherals. The company was experiencing failures in an aluminum cast, Y-shaped fork used in automobile transmissions.

Kiowa first learned of the problem from one of its customers, who had a metallurgist examine the broken parts and report findings to Kiowa. The problem, Kiowa concluded, was in the part's "microstructure." Kiowa needed help understanding the findings and so they contacted John Van Engelenhoven, the CIRAS representative for Marshalltown. Van Engelenhoven, in turn, consulted with IPRT's Iowa Companies Assistance Program, which specializes in solving materials problems.

Paul Berge, a metallurgist at Iowa Companies Assistance Program (ICAP), got right on the case. Like any good detective, Berge laid out what was known. This included the metallurgical report of a microstructure problem and the knowledge that the failed parts all came from the same cavity in a "spray," where four parts were made at a time, each with their own cavity. Berge decided to have a look at the parts himself. He examined fractured forks using Scanning Electron Microscopy, a tool not normally part of a company's arsenal of equipment but available through ICAP. He also broke two new forks in a similar fashion to the failed parts and examined them, but upon close examination could not detect any difference in microstructures between the failed parts and good ones. "The microstructure was not necessarily the root cause of the problem," Berge concluded.

Then came a break in the case. Berge looked at the die casting spray as a whole and noticed that forks made in one particular cavity had scuffed surfaces in the area where the failures occurred. What's more, all of the forks from this cavity had the same appearance. "At this point, a light went on," Berge said. He concluded that a defect in the mold was damaging forks made in the one cavity. He shared his findings with Kiowa, who confirmed that, indeed, there was a problem with the mold and had it fixed. The end result was reduced scrap for Kiowa. The whole project took less than two months. ■

For more information contact John Van Engelenhoven at 1-641-791-0765 or jve@iastate.edu; Paul Berg at ICAP 1-515-294-5972.

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Stacy retires



Denzil Stacy retired from CIRAS in October after 25 years of service as a field representative in Northwest Iowa. Stacy provided management and technical assistance to several industries around Sioux City, Fort Dodge, and Webster City. He helped in feasibility studies for value-added agriculture products, engineering design, cash flow and business planning of new and expanding industries, and the development and testing of new products.

“I have been impressed with the large diversity of products manufactured and the wide range of markets served,” said Stacy, who made particular note of the creativity and tenacity of his clients in keeping their companies strong through change and challenging times. As Stacy looked back on his

years at CIRAS, he mused on the notable changes that have taken place, from the use of computers for information management and manufacturing processes to fax machines!

Among his many accomplishments, Stacy edited the last edition of the State of Iowa, DNR, and Forest Products directory. He also served on numerous extension and CIRAS committees. Stacy lives on a small farm near Sioux Rapids, where he plans to continue his hobbies in woodworking, gardening, camping, and fishing.

Hansson leaves CIRAS



CIRAS bids farewell to Joanne Hansson, editorial assistant to CIRAS News for almost three years. Hansson and her husband will reside in Sweden, where they have a large family.

In addition to editorial assistance, Hansson served CIRAS in other ways—as a coordinator of events such as the Midwest E-business Conference and Tech 2000, an assistant to retired director Richard Grieve, and a general “go-fer” in a number of CIRAS activities. Prior to CIRAS, Hansson worked for several years at the Center for Agriculture and Rural Development (CARD) and the Iowa State University Foundation.