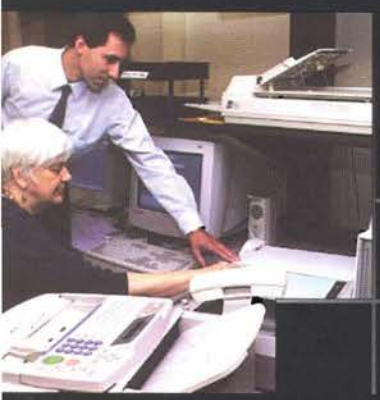
PURDUE UNIVERSITY

TECHNICAL ASSISTANCE PROGRAM

A YEAR IN REVIEW
JULY 2000-JUNE 2001



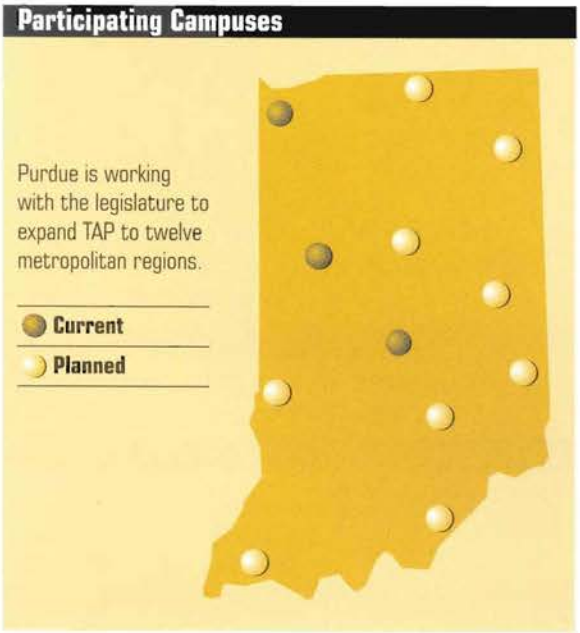
Engaging with Indiana business to build our economic future

DIRECTOR'S MESSAGE

Engaging with Indiana business to build our economic future

The Purdue University Technical Assistance Program (TAP) was established 15 years ago to help business, industry, and government implement new technologies that benefit the citizens of the State of Indiana. Since that time, TAP has worked with more than 4,500 companies, business startups, entrepreneurs, and others to help them grow in Indiana.

The Technical Assistance Program joins forces with Indiana companies to help boost international competitiveness. Companies are rapidly adopting new information technology, e-commerce, integrated product development, lean manufacturing, and other advanced business methods. These changes require the most current expertise, and TAP helps by creating opportunities for companies to recruit Purdue students for internships and full-time positions. The results of these efforts are impressive. Indiana continues to be a leader in exported goods, and more graduates are remaining in our state.



The challenge of global competition has never been greater, and the partnership between Indiana companies and Purdue University has never been stronger. The examples in this review illustrate the success that results from cooperation between talented business people and dedicated faculty, staff, and students at Purdue.

David R. McKinnis
July 2001

BENEFITS FOR INDIANA

The Technical Assistance Program (TAP) engages Indiana business, industry, and government with the vast resources of Purdue University. TAP partners with other Purdue programs, state agencies, and local economic development groups to meet the challenging needs of Indiana companies.

Since 1986, TAP has:

- Increased the placement of Purdue graduates in Indiana businesses through summer internships and high-tech job fair programs.
- Strengthened the competitiveness of industrial and high-tech companies through the adoption of state-of-the-art technologies.
- Implemented environmental improvements such as the reduction of odors from industrial processes, pollution prevention, and more efficient operations of local wastewater treatment plants.
- Provided ready access to information and document delivery through the Technical Information Service.

Through TAP, more than 250 Purdue faculty, professional staff, and students serve nearly 500 companies each year. The benefits to the state are significant.

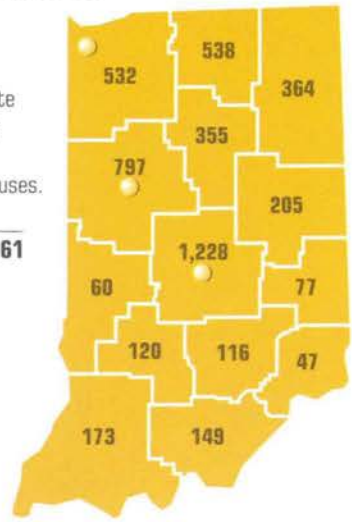
The many achievements listed in this review reflect a strong working relationship between talented businesspeople in Indiana and faculty, staff, and students at Purdue University. TAP clients are asked to provide feedback on the assistance received. Nearly all clients report a positive experience with TAP programs and half provide specific economic impact numbers.

Projects by Region

May 1986 through June 2001

TAP faculty, graduate students, and staff are available from three Purdue campuses.

Total projects: 4,761



Indiana Businesses Served in 2000-01: 489

Economic Impact

Based on client evaluations of TAP work

	Fiscal Year 2000-01	Total for Past 10 Years
Capital Investments	$1,460,000	$56,809,700
Cost Savings	$847,050	$19,209,570
Increased Sales	$1,857,100	$234,076,200
Jobs Added	23	1,012
Jobs Saved	49	1,995

Technical Assistance Projects

Each year, hundreds of Indiana companies receive confidential, no-cost assistance on short-term projects. Extended projects are available on a funded basis.

Common project topics include:

Information Technology
- Electronic commerce issues
- Web-based computing
- Networking
- Improvement of computer-assisted engineering methods

Business Management
- Financial management
- Business strategy
- Product costing, pricing, and marketing

Advanced Manufacturing
- Implementation of lean manufacturing practices
- Facility planning in production and warehouse areas
- Process simulation
- Process improvements for machine centers, assembly lines, and individual workstations
- ISO and QS 9000 issues

Product Development and Engineering
- Review of design changes and improvements
- Material selection for specific applications
- Problem solving such as corrosion or component failure
- Assistance with design tools and software

Environmental
- Waste treatment and disposal problems
- Industrial odor problems
- Compliance with environmental regulations
- ISO 14000 issues

Read about specific examples on pages 6-8.

High Tech Job Fair for Indiana Companies

The High Tech Job Fair is held each fall at Purdue's West Lafayette Campus and provides the opportunity for 100 Indiana companies to compete for Purdue graduates in high-tech fields.

Read about specific examples on page 5.

Technical Information Service (TIS)

Each year, TIS performs hundreds of information searches and delivers thousands of documents.

Common requests include:
- Engineering and technology articles
- Marketing information
- Biological, veterinary, and pharmaceutical sciences questions
- Information on management practices
- Agricultural questions

For more information, see page 9.

BENEFITS FOR INDIANA

continued

Summer Intern Program

The summer intern program places Purdue students with Indiana companies to work on e-commerce, product development, manufacturing, environmental, and industrial management projects.

Typical projects include:

- Implementation of e-commerce and Web-based business systems
- Lean manufacturing
- Improvement of ISO and QS 9000 quality systems
- Selection and implementation of management systems such as costing and scheduling
- Product design, testing, modeling, and evaluation
- Infrastructure projects for municipalities

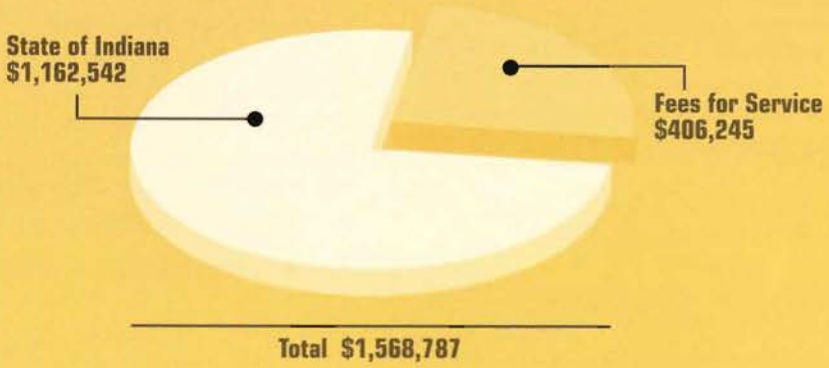
Read about specific examples on pages 10-11.

Program Funding

Fiscal Year 2000-01

During the past fiscal year, the Technical Assistance Program and the Technical Information Service were supported by state funding and fees for services.

Funding Sources



Total $1,568,787

In addition to this funding, the total payroll for TAP summer interns (paid directly to students by their employers) was $588,000.

The Technical Assistance Program is administered by the Purdue University Schools of Engineering.

www.purdue.edu/TAP

HIGH TECH JOB FAIR

for Indiana companies

Eli Lilly and Company, Indianapolis
www.lilly.com

Eli Lilly is a leading innovation-driven pharmaceutical corporation that employs more than 14,000 people in Indiana. The company participated in the fall 2000 High Tech Job Fair to recruit students for information technology positions. Jessica Wright met with Lilly personnel at the job fair and is now employed as an information analyst with the company. Jessica graduated from Purdue University Calumet in May 2001 with a major in systems analysis and design and a minor in Spanish.

Raytheon, Indianapolis
www.raytheon.com

Raytheon Indianapolis is part of the global Raytheon Company, one of the largest defense contractors in the world. The Indianapolis facility provides a full range of technical services for electronic components and systems. These services span the product life cycle and include prototype development, system design, hardware and software implementation, and fielding of systems. Christine Keefer was recruited by Raytheon at the fall 2000 Purdue High Tech Job Fair. She graduated in December 2000 with a B.S. in management and a minor in management information systems and is now employed as the software configuration manager for the state-of-the-art V-22 Mission Planning System.

2000 Job Fair Summary	
Businesses Served	101
Students in Attendance	1,200

Future High Tech Job Fairs

Tuesday, October 29, 2002
Wednesday, October 29, 2003

For information and registration, visit:
www.purdue.edu/jobfair

PROJECT EXAMPLES

CGM Manufacturing, Indianapolis

www.CGM.to

CGM is a rapidly growing company providing specialty concrete bases and enclosures for the telecommunications industry. The company asked Purdue for help making significant improvements to the manufacturing process. Professors Doug Sutton and Jason Weiss analyzed CGM's customer needs and provided recommendations for an automated batch plant, quality control, and process layout. These recommendations were implemented with great success, resulting in reduced production costs, a 33 percent increase in sales, the capability to meet stringent customer quality requirements, and the capacity to continue rapid company growth.

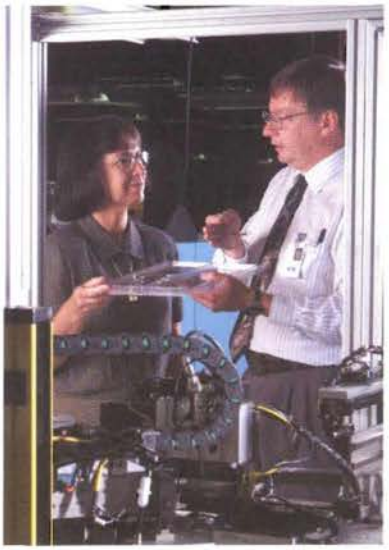
Doug Sutton, associate professor of civil engineering, and Susan and Fred Machledt, co-owners of CGM, examine an advanced flush-to-grade, cross-connect enclosure that provides telecommunications switching for thousands of phone lines in major cities.

CTS Corporation, Berne

www.ctscorp.com

CTS Corporation designs, manufactures, and sells a broad line of electronic components and assemblies, primarily serving the electronic needs of original equipment manufacturers.

The Berne facility requested TAP assistance in planning and implementing advanced quality management techniques on their cursor control product line. Regina Becker and Dwight Beaudry (a graduate student in statistics) worked closely with Eric Taylor and others to develop a comprehensive set of recommendations to improve quality management for this complex product line. These recommendations were implemented with great success – process variability was significantly reduced, costs were lowered, and the Berne facility now competes favorably with global manufacturers of cursor control products.



Regina Becker, manager of statistical consulting at Purdue, and Eric Taylor, CTS quality engineer, discuss the production of cursor control products.

Project examples used with permission.

www.purdue.edu/TAP

Nachi Technology, Greenwood

www.nachitech.com

The Nachi Greenwood facility is a major supplier of angular contact ball bearings used in automotive air-conditioning systems. Keith Shui was employed as a summer intern to develop methods to stabilize the heat gain in the machining coolant used for high precision grinding. Professor Ecer provided guidance to Keith on this complex and challenging project.

Kevin Dhonau, engineering support manager of Nachi; Keith Shui, mechanical engineering summer intern; and Akin Ecer, professor of mechanical engineering at Indiana University-Purdue University Indianapolis, discuss the company's bearing products.

Noble of Indiana, Indianapolis

www.nobleofindiana.org

Noble of Indiana is a leading non-profit organization serving persons with developmental disabilities in central Indiana. Noble asked for Purdue's assistance in developing a billing process that would streamline conformance to very complex regulations from local, state, and federal agencies. Professor Sullivan and Vicky Loveless worked with numerous management employees to develop comprehensive documentation of their billing regulations and processes. This documentation is now being used to guide the development and implementation of a new billing system.

Connie Dillman, executive vice president and COO of Noble of Indiana; Charlene Sullivan, professor of management; and Vicky Loveless, graduate student in management, review progress on the development of a new billing system.

2000-01 Assistance Projects	
Businesses Served	210
Projects Completed	260
Purdue Personnel and Students Involved	71

TECHNICAL INFORMATION SERVICE

The Purdue Technical Information Service (TIS) uses advanced search techniques and databases to find and deliver publicly available information from worldwide sources. TIS also performs Web-based information searches for clients who need assistance with complex information requests. Eighty percent of TIS information requests are filled from the vast collections of the Purdue Libraries. Information can be delivered via the Web, fax, overnight carrier, or U.S. mail. To date, TIS has performed 4,352 information searches and has delivered 140,885 documents.

Information provided includes government reports, statistics, standards, patents, journal articles, books, media publication reprints, trade association data, business trends, emerging technologies, trade show dates, medical facts, demographic information, and marketing trends.

TIS billing includes applicable copyright fees. Major credit cards are accepted.

The Technical Information Service now offers eDOC, an advanced Web-based document delivery system that utilizes a high-quality PDF format. Customers who request delivery via eDOC receive an e-mail message with a link to their document for viewing and printing. The eDOC delivery option can provide documents in a few hours, saving time and shipping costs.

2000-01 TIS Activity	
Businesses Served	108
Information Searches Conducted	163
Documents Delivered	11,373
Purdue Personnel and Students Involved	28

Claire Alexander and Jeff Johnson work at the eDOC station.

Vickie McLaughlin and Mary Dugan confer in the Veterinary Medicine Library.

www.purdue.edu/TIS

SUMMER INTERNS

A key to finding future employees

Terronics Development Corporation, Elwood

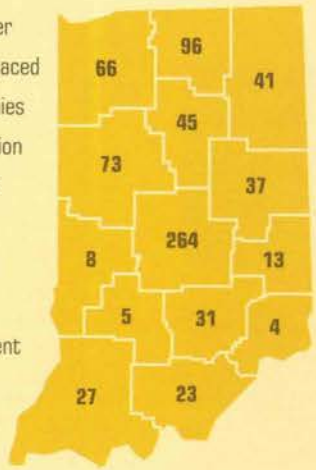
www.terronics.com

Terronics is a small, dynamic company that invents, designs, and builds state-of-the-art powder and liquid electrostatic coating equipment for metal processing, biomedical, and food processing applications. The company employed five students from electrical engineering technology and mechanical engineering technology to support the development, design, and installation of complex coating machinery.

Eric Schopmeyer, Tim Baier, Kyle Dickey, Josh Crites, and Russell Bullock review new coating technologies under development in the company's research laboratory.

Interns by Region, 1988-2001

To date, 733 summer interns have been placed with Indiana companies to work on information technology, product development, manufacturing, environmental, and industrial management projects.



Total Interns: 733

Austin Tri-Hawk Automotive, Inc., Austin

www.tri-hawk.com

Austin Tri-Hawk is an advanced, tier-one supplier of body structure stampings and assemblies for the automotive sector. Three students were employed to support this rapidly growing company. Lucky Rumengan, a computer science summer intern, improved networks and information technology systems. Mary Gabriel, an industrial engineering summer intern, analyzed and upgraded quality systems. Kara Dailey, a mechanical engineering summer intern, developed more productive plant layouts and improved material flow.

Lucky Rumengan, Mary Gabriel, and Kara Dailey examine a rear skirt assembly produced at Austin Tri-Hawk for the popular Subaru Outback.

Indiana High School Athletic Association, Indianapolis

www.ihsaa.org

The Indiana High School Athletic Association was established in 1903 to encourage and direct wholesome amateur athletics in Indiana high schools. The association employed Jason as a summer intern to help develop an interactive, user-friendly Web site. The upgraded Web site will provide comprehensive information and statistics to the thousands of athletes, parents, and supporters who follow Indiana high school athletics.

Jason Rees, graduate student in technology, and Tom Perkins, director of information technology for the IHSAA, discuss new features on the association's Web site.

Indesign, Indianapolis

www.indesign-llc.com

Indesign offers complete electronic product engineering design services for the medical, telecommunications, computer, networking, and consumer products industries. Fahim's summer assignment included circuit design, consideration of electromagnetic interference issues, and the development of bills of material and product documentation.

Fahim Abdul Ghaffar, electrical and computer engineering summer intern, and Scott Early, senior electrical engineer, review progress on the design of an interactive video terminal for use in retail stores.

2000-01 Summer Internship Program	
Businesses Served	70
Students Involved	101
Purdue Schools Represented	6

ECONOMIC RESOURCES

Purdue University offers many resources to support the growth of business in Indiana. Visit Connect Indiana at **www.purdue.edu/Research/ConnectIndiana** for further information.

Don K. Gentry, vice provost for engagement, works with Indiana's leaders, the business community, and citizens to find ways for Purdue to expand outreach opportunities in the state.

Clean Manufacturing
Phone: (765) 463-4749
www.ecn.purdue.edu/CMTI

Manufacturing E-Business
Phone: (765) 496-2953
www.tech.purdue.edu/centers/dec

High Tech Startups
Phone: (765) 496-6140
www.purdue.edu/Research/PRF/Gateway.htm

International Business
Phone: (765) 496-6779
www.mgmt.purdue.edu/centers/ciber

Lifelong Learning
Phone: (765) 494-7231 or (800) 359-2968
www.oiell.purdue.edu

Agribusiness
Phone: (765) 494-8489
www.ces.purdue.edu

Research
Phone: (765) 494-6200
www.purdue.edu/research

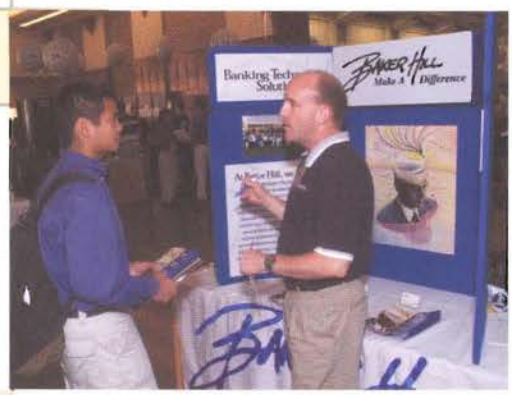
Student Recruiting
careersINsite
Phone: (765) 496-1753
www.careersINsite.com
or
Center for Career Opportunities
Phone: (765) 494-3981
www.cco.purdue.edu

High Tech Job Fair
Phone: (765) 494-6258
www.purdue.edu/jobfair

Technical Assistance Program
Phone: (765) 494-6258
www.purdue.edu/TAP

Technical Information Service
Phone: (765) 494-9876
www.purdue.edu/TIS

Transportation Infrastructure
Phone: (800) 428-7639
www.ecn.purdue.edu/INLTAP



www.purdue.edu/TAP

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Industry Advisory Council
Indiana business leaders

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Indianapolis

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Vice President for Manufacturing
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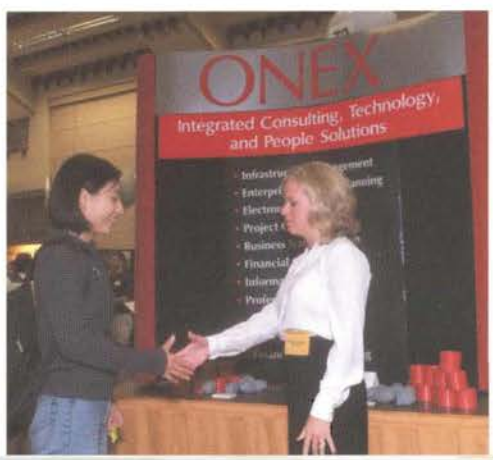

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REQUESTING ASSISTANCE

Assistance Projects

These projects provide recommendations on a wide range of issues including manufacturing improvements, product development, industrial management, and environmental problems.

Typical Projects
- Information technology
- Lean manufacturing
- Plant and warehouse layout
- E-business
- Design recommendations
- Environmental issues
- Activity-based costing
- Statistical analyses

Costs and Confidentiality
For qualifying projects, TAP provides up to five days of Purdue assistance at no charge. Extended assistance is available and quoted by project. All project information, including company name, is kept confidential. Examples in this publication are used with permission.

Technical Information

The extensive technical collections of the Purdue Libraries, as well as sources worldwide, are used to fill information needs on virtually any topic. Document delivery is provided via the Web (eDOC), fax, or overnight carrier.

Typical Projects
- Technical articles
- Patent searches
- Industry standards
- Marketing data

Costs and Confidentiality
Each request is quoted individually. Typical fees are $150 for an in-depth information search and $15 for each document sent. All work is kept confidential. Major credit cards are accepted.

High Tech Job Fair for Indiana Companies

This event is held each fall at the Purdue West Lafayette Campus and helps Indiana companies fill high-tech positions.

Information and Registration
www.purdue.edu/jobfair

Summer Interns

This program helps companies find qualified students for 12-week summer projects.

Typical Projects
- Product design
- E-business
- Lean manufacturing
- Facilities planning
- Product costing
- Manufacturing systems
- Civil engineering
- Computer-aided design
- Materials testing
- Software development

Costs and Confidentiality
Interns are employed directly by the company. Competitive compensation for a summer intern ranges from $5,000 to $7,500. There is no charge for limited faculty assistance. All project information is kept confidential.

Contact Information

Technical Assistance, Summer Interns, and High Tech Job Fair
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www.purdue.edu/TIS

NOTES

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