

u n i v e r s i t y o f w i s c o n s i n - m a d i s o n
s c h o o l o f b u s i n e s s



erdman center for manufacturing and technology management

a n n u a l r e p o r t 2 0 0 1 - 2 0 0 2



letter from the dean

l e t t e r f r o m t h e d e a n



In this annual report, you will read about some of the many accomplishments of the Erdman Center for Manufacturing and Technology Management over the past

year. You'll learn about student activities, the placement

of Erdman graduates with leading technology-based firms and valuable research being conducted in a variety of areas.

The Erdman Center has made remarkable strides since its founding in 1994. An important reason for that progress is the multidisciplinary focus it has taken from the very beginning. Its collaborative, cross-disciplinary curriculum is possible thanks to the efforts of our colleagues across campus, particularly in engineering and the life sciences.

The Erdman Center also has been able to integrate its efforts with outstanding companies working in the area of manufacturing and technology management. Over the past year, Erdman students have visited facilities in the United States and

Mexico to view "best practices" in manufacturing. They've had the chance to interact with members of the Erdman Center's Industrial Advisory Board, and they have benefited from summer internships with leading firms.

However, it is the faculty, staff and students — and in recent years the alumni — of the Manufacturing and Technology Management program who are central to the center's success. The Erdman Center is an example of how much a center can accomplish with the right people and the right vision.

Firms in the United States and the rest of the world are continuing to reshape themselves at a rapid pace. We are fortunate that the School of Business can offer a resource of the caliber of the Erdman Center to help enable our students to acquire the in-depth educational background needed to tackle the important challenges ahead for firms in manufacturing and technology-based industries around the world.

Michael Knetter
Dean



message from the director

This past year was full of transitions and travels. We not only welcomed nine new students, but a new center assistant. We began offering the MBA in MTM in the fall of 2001 and had our first MBA graduate in December. We traveled to Texas and Mexico in the spring and visited a wide variety of manufacturing and production facilities. All of this, in addition to our traditional activities and events, made for an exciting time for the students and staff of the Erdman Center!

Curriculum News

The Manufacturing and Technology Management (MTM) program, which previously has only been offered as an MS degree, is now offered as an MBA as well. We join several prominent business schools, like Northwestern, Purdue, Yale, and Carnegie-Mellon, who have had master's programs but only recently have started to grant MBAs. In particular, programs similar in nature to MTM, such as MIT's Leaders in Manufacturing and Northwestern's Master of Manufacturing Management, now offer students an MBA. Although the MBA takes longer than the MS, we expect that the majority of students will pursue the more well-known MBA degree.

Personnel News

Pragya Mishra graduated from the School of Business in December and left her position as center assistant. Her replacement, Kinsey Heyerdahl, joined us in November and has been an invaluable asset to the Center. She is an accounting major in the School of Business.

Students - Coming and Going

We were pleased to welcome nine new students in the fall. Six students graduated from the MTM program during the past academic year (December 2001/May 2002), and one student decided to change majors.

Fifteen MTM students in the fall, and 17 in the spring, received financial support as project assistants (working on industry, university, or Erdman Center projects), teaching assistants, or in the form of fellowships. Of these, two students were supported by a grant from the Ford Motor Company.

Eight MTM students who pursued summer 2002 internships were placed. Internships and the graduates' employment information are highlighted later in this report.

Student Activities and Events

After a busy Fall Orientation session before classes began, MTM students and some Operations and Information Management faculty enjoyed a cruise around Lake Mendota. Wonderful weather and the opportunity for MTM students to get to know the faculty and each other made for a delightful afternoon.

In October/November, the Center arranged for "mock interviews" for the MTM students. Human Resources representatives from Marshall Erdman & Associates, Datex-Ohmeda, and Kraft participated. A special session on presentation skills was held in mid-October.

In October and March, MTM students along with Carol Aspinwall, assistant director of the Center, served meals donated by the Monona Terrace to the homeless men at the shelter at Grace Episcopal Church in Madison.

The annual Quick Response Manufacturing conference was held in Madison on October 22-23. Some MTM students and staff attended, and the event was covered in our newsletter.

In early November, we assembled the MTM students for a Student Roundtable. The purpose of these meetings is to provide a forum for student suggestions aimed at improving all aspects of the Center and the MTM program. Many valuable ideas about marketing the MTM program were proposed and returning students offered advice about course selection to the new MTMers.



MTM students, staff and OIM faculty also spend time together outside of the Center.

Carol Aspinwall and eight soon-to-graduate MTM students represented the Erdman Center at the National Manufacturing Recruiting Forum (NMRF) in Novi, MI last November. Students from the Grainger Center for Supply Chain Management and from the Manufacturing Systems Engineering program also attended. As a result, UW-Madison had the third largest representation at the Forum, along with the University of Michigan and the University of Pittsburgh.

Thanksgiving had an international flavor this year. More than 30 MTM students and family and friends from Pakistan, Taiwan, Korea, India, China, and the U.S. attended Thanksgiving dinner at Carol Aspinwall's home. In addition to the traditional Thanksgiving turkey and dressing, dishes from the home countries of the MTM students were served.

Two MTM students, Marni Sauer and Leonel Preza, were initiated into the Alpha Chapter of Beta Gamma Sigma, the honors society for graduate students.

Our combined holiday and fall graduation celebration was held at the Pyle Center in December. Besides recognizing our sole December graduate, Brian Larson, many attending students and guests received door prizes donated by alumni and Industrial Advisory Board companies.

In April, several MTM students and Carol Aspinwall participated in the American Cancer Society Walk/Run along with other School of Business students and staff.

In May, we held our annual Spring Graduation party. Fifty guests gathered in Grainger Hall where we recognized the five May and - somewhat ahead of time - three August graduates.

Advisory Board Meetings

The Center held its customary semi-annual Industrial Advisory Board meetings in November 2001 and April 2002. The main focus of the fall meeting was to discuss the upcoming offering of the MBA degree and plans for the spring field trips. At the spring meeting, we played a survivor game as a prelude for a discussion of teamwork, and also discussed the economy and the viability of a manufacturing-oriented program in the face of the declining manufacturing sector in the U.S. At both meetings, MTM students gave presentations to the Board on their internship projects.

Program Promotion

Three issues of *Manufacturing and Technology Matters* (our Center newsletter) were published and distributed during the year. The newsletter informs industry, alumni, potential students, and our supporters inside and outside the university about our activities and of interesting trends in the MTM domain.

The Center's *2000/2001 Annual Report* was produced and used as a combined program brochure and activity report for our stakeholders in industry and academia.

An article on the MTM program, entitled "Manufacturing and Technology Management (MTM)," was published in the *Wisconsin Professional Engineer*, Vol. 42, No. 5 (Sept/Oct 2001) issue, pp.16-17.

The Erdman Center continued to co-sponsor the G. Steven Burrill Technology Business Plan Competition - an initiative championed by Professor Anne Miner in the School of Business (who is a member of the Erdman Center's Academic Advisory Board). The competition awards \$24,000 in prize money to teams of students, drawn mostly from business and engineering, that develop the best business plans involving new technology.

For internal promotion, the Center sponsored a Master's Breakfast in the School of Business in January. This provided an opportunity to display MTM material and discuss the program with interested students and faculty.

The Center also continued its support of the research journal, *Manufacturing & Service Operations Management*. Together with other sponsoring centers at top schools around the country, the Erdman Center has its name listed in the printed version of the journal and on the journal's website.

Employer Development

Carol Aspinwall's employer development travels included attendance at the Rocky Mountain and Southwest Association of Colleges and Employers Conference in Keystone, CO in July and NMRF in Michigan in November. She was also very active promoting the MTM students in the fall and spring School of Business Career Forum and College of Engineering Career Connections (university-arranged job fairs) and attending several employer receptions in the School of Business and the College of Engineering.

Looking Ahead

With the addition of the MBA degree, the MTM program is in good shape to attract and educate the best and most ambitious minds from around the world. The carefully selected students continue to be above average with respect to work experience and test scores, and distinguish themselves in the classrooms. Some of the early graduates among our now 39 alumni are beginning to move into senior positions, and my conviction is that all our graduates will make lasting imprints on the organizations where they work in the course of their careers.

That said, this last year was undoubtedly one that posed the greatest challenge to us and our students since the inception of the MTM program. With the economy seriously slowing down on a world-wide basis, the job prospects for our students were fewer and sometimes less attractive than in recent years. However, the broad-based education that the MTM program provides makes our graduates prepared to take on a great variety of positions. This, combined with the ambitions that our students typically harbor, will ensure they will end up in exciting and satisfying jobs. Although we are striving to make the program more flexible within the constraints of the MBA degree, there is no need to change its main focus. Due to the possibly long-term dip in the economy, however, we will increase our efforts in the employer development arena in order to make valuable contacts for our graduating students.

As always, I thank all our sponsors and friends for their dedicated support during this past year!

Urban Wemmerlöv
Director, Erdman Center

about the erdman center

a b o u t t h e e r d m a n c e n t e r

Center Mission:

To develop leaders for manufacturing and technology-based organizations.

To support research on the theory and practice of managing manufacturing and technology-based organizations.

Center Vision:

To become internationally recognized as a provider and supporter of education and research in the area of managing manufacturing and technology-based organizations.

The Erdman Center for Manufacturing and Technology Management directs Master of Business Administration (MBA) and Master of Science (MS) degrees focused on Manufacturing and Technology Management, and generally supports education and research in that field. The Center is housed in Grainger Hall, the home of the School of Business.

The Erdman Center has strong links to other centers, programs, and departments on campus - especially to the Grainger Center for Supply Chain Management, the Center for Quick Response Manufacturing, the Consortium for Global Electronic Commerce, the Manufacturing Systems Engineering program and the departments of Industrial Engineering, Operations and Information Management, and Management and Human Resources.

The Center began operating in the spring of 1994 and was strongly supported by the then Dean Andrew J. Policano. The staff was limited to Founding Director Urban Wemmerlöv and part-time Center Assistant Kathy McCord until the position of assistant director, first held by Robin Winistorfer, was added in the fall of 1997. In July 2000, Carol Aspinwall became the assistant director.

The Center was made possible by a generous endowment from Marshall Erdman in memory of

his late wife. Joyce Erdman was a strong supporter of the School of Business, the university, and the community. Her prominent public service roles included president of the Board of Regents (for the University of Wisconsin System), president of the Board of Visitors (School of Business), president of the Madison Art Center, president of the Alliance of Children and Youth, and others.

Marshall Erdman, who died in 1995, was the founder of a successful architectural firm and furniture manufacturing company (Techline) – of nationwide prominence. Marshall and Joyce shared an interest in innovative business practices, and a desire to improve the productivity of U.S. industry through cross-functional organizational practices. The idea to support university education in this area came after they heard a lecture based on the book *Made in America* - the MIT Commission's report on the status of America's manufacturing industry and what society and universities can do to help industry regain its former strength.

The contribution by Marshall Erdman, later generously extended by his children Deborah, Tim, Rustin, and Dan, has allowed the School of Business to fulfill a significant need in graduate business education in manufacturing and technology management.

center income and expenses

center income and expenses

- The core of the Center's spendable income is in the form of interest from the Center endowment. During the last year, this interest amounted to \$263,474. The Center also receives personal gifts and company contributions. These contributions totaled \$42,212 for the year, of which \$26,037 came from board member firms. Total earnings for 2001/2002 amounted to \$300,686.
- In addition, Ford Motor Company, in fall 2001, provided three full scholarships for the MTM program. Ford Motor Company also gifted money to support field trips to best-practice firms. Ford's generous support extends for five years. The total award is for \$280,000.
- CIBER supported our MTM best-practices road trip to Texas and Mexico. Their gift of \$5,000 was very much appreciated!

The expenses for the last six fiscal years (1996-2001) are shown in the table below. Total expenditures for the 2001-2002 year were \$274,800. The two largest categories were Center staff salaries (57%) and student support (28%). The increase in student support was due to the increase in tuition fee remission. Travel for students and staff increased due in part to our participation in NMRF in Pittsburgh and the MTM Best Practices Road Trips funded by the Ford Motor Company. The cost of social gatherings increased due to the Fall Orientation Cruise and increased costs for student gatherings (graduation, holiday events) and roundtables.

Excess income is channeled into the Center's main endowment to build stability for the future.

Summary of Expenditures: Fiscal Years 1996 - 2001 (July 1 - June 30)

Fiscal Year	Total Exp.	Total Exp.	Total Exp.	Total Exp.	Total Exp.	Total Exp.
Center salaries (incl. fringes)	\$155,468	\$141,662	\$111,290	\$87,885	\$84,667	\$63,290
Student support (incl. fringes)	\$75,744	\$46,573	\$65,053	\$40,416	\$39,428	\$17,861
Advisory Board meetings	\$4,316	\$6,167	\$5,106	\$6,011	\$4,572	\$3,669
Center/program promotion	\$18,457	\$15,476	\$23,462	\$10,279	\$8,983	\$14,353
Travel	\$8,480	\$4,798	\$1,567	\$925	\$50	\$1208
Social gatherings, roundtables	\$4,821	\$1,927	\$1,418	\$1,314	\$932	\$272
Computer expenses	\$801	\$6,203	\$2,104	\$4,104	\$5,734	0
Maintenance, repairs, and supplies	\$544	\$174	\$895	\$1,280	\$526	\$778
Training (Center personnel)	\$540	\$769	\$300	0	0	0
Other expenses	\$5,628	\$9,729	\$2,544	\$3,123	\$580	\$12
Total Expenses	\$274,800	\$233,478	\$213,739	\$155,337	\$145,472	\$101,443

mtm as an area of study

m t m a s a n a r e a o f s t u d y

Manufacturing and Technology Management - MTM - is a cross-functional area of study that is concerned with operational, strategic, economic, and human issues related to the development, production, and delivery of goods and services in a global environment. As such, MTM focuses particularly on the adoption, implementation, and use of technologies - whether embedded in new products, in the processes by which products are designed, manufactured, and delivered, or in the information systems that support these activities.

The MTM program at the UW-Madison School of Business attracts students who are interested in business processes that span from "raw material to the customer" and want to develop a broad,

inter-disciplinary knowledge of the managerial issues facing industries as they pertain to operations and technology development/ acquisitions. To meet that challenge, coursework is drawn not just from the business school, but also from many other departments and schools on campus. The MTM program is flexible enough to meet the needs of students planning careers in a variety of industries, from machine tools to electronics, and from pharmaceuticals to consulting. In order to produce the best future managers or consultants possible, the program requires a background in engineering or the sciences (some exceptions are possible) and industrial experience.

t h e m t m c u r r i c u l u m

The MBA and MS degrees provide students with a solid foundation in functionally oriented business subjects such as accounting, finance, and marketing, as well as skills in managing the development of new products and services, product and process design and improvement, and the implementation and use of new information and process technologies.

Through its interdisciplinary focus, graduates of the MTM program develop a holistic view of the firm. This integrative focus helps them to effectively communicate with personnel from diverse

functions and organizational levels, and solve complex business problems in team environments.

In order to ensure practical relevance, the MTM program brings current industrial thinking into the curriculum in a multitude of ways. Internships or industry-focused independent studies, seminars on current topics, guest speakers from industry, and company site visits provide opportunities to learn and apply theoretical knowledge to real-life situations.

mtm as an area of study

The MBA in MTM

The MBA degree requires 20 credits of business foundation courses, 14 credits of advanced business courses, and a minimum of 24 credits beyond the foundation and advanced courses – for a minimum of 58 credits. At least six of these credits must be taken outside the School of Business.

Foundation Courses (20 credits)

- Financial Accounting
- Managerial Accounting
- Introduction to Financial Management
- Motivational Effectiveness
- Leadership Effectiveness
- Marketing Management
- Managerial Economics
- Operations Management

Advanced Credit Courses (14 credits)

- Managerial Communication
- Managing the Legal Environment
- Data Analysis for Managers
- Ethics and Social Responsibility
- Business Strategy
- The Strategic Management of Innovation and Technology
- Corporate Strategy

The MS degree in MTM

This degree track requires 11–13 business foundation courses and a minimum of 32 credits beyond the foundation level – for a minimum of 45 credits. As with the MBA, at least six credits must be taken outside the School of Business.

The MS degree allows for more in-depth specialization than does the MBA and is suitable for those wanting a shorter time to obtain the degree, more specialization in MTM, to acquire double majors (e.g., in business and engineering), or to pursue a PhD. Most of the courses listed for the MBA are suitable for the MS as well.

Required Courses in the MTM Major

Core Requirement: (4 credits)

Managing Technological Change in Manufacturing Systems

MTM Seminar:

The MTM seminar typically meets in the spring semester and is required for all MTM students. It provides exposure to emerging technologies and their adoption, new ways of organizing and managing firms, and current industrial perspectives by management and labor on these issues. The seminar involves guest speakers from industry, consulting firms, and software/equipment providers, as well as field trips. A segment on oral/written presentation skills is also a part of this seminar.

Constrained Electives (15 credits)

Courses from each of these concentration areas: Manufacturing and Technology Management (MTM) and E-Business/IT Strategies and Applications and Project course.

Concentration Area: MTM (9 credits)

Transportation and Business Logistics or Logistics Strategies

Production Planning & Control

Operations Research II

Global Manufacturing and Logistics

Introduction to Quality & Productivity Improvement

Planning for Quality in New Services and Products

Reorganizing the Factory: Competing through Cellular Manufacturing

Project Management

Intro to Manufacturing Systems, Design, and Analysis

Engineering Management of Continuous Process Improvement

Quality Assurance Systems

Introduction to Quality Engineering

Computer Integrated Manufacturing

Inspection, Quality Control and Reliability

Patent Law or Product Safety Law

Concentration Area: E-Business/IT Strategies and Applications (3 credits)

Seminar in Information Systems

Entrepreneurship in the E-business Landscape

E-Commerce: Technologies, Strategies and Applications

Project Course: (3 credits)

Design & Analysis of Manufacturing Systems

Introduction to Quality & Productivity

Improvement Planning for Quality in New Services & Products

Other team-based courses in business, engineering, or the physical/life sciences may be used, subject to advisor's approval.

Free Electives (5 credits)

The free electives assist MTM students in acquiring an up-to-date knowledge base in the science or technology area and/or to deepen their skills in management.

admission to the mtm program

admission to the mtm program

The Center staff reviews all applications to the MTM program and interviews potential candidates. Applicants are evaluated in eight areas: GMAT scores, TOEFL score (if English is not their first language), work experience, undergraduate degree, essays, letters of recommendation, career goals, and communication/interpersonal skills.

MTM students entering the program since the fall of 1996 have had the following characteristics:

Student Characteristics (averages)

	01-02	00-01	99-00	98-99	97-98	96-97
Undergrad. GPA: (domestic students)	3.75	3.56	3.37	3.33	3.29	3.92
GMAT Score:	634	654	659	635	642	613
Work Experience (yrs):	3.9	4.2	4.2	5.4	7.4	5.0

financial support

financial support

The Center is committed to help support qualified candidates with project assistantships, teaching assistantships, or cash scholarships. During the 2001 - 2002 academic year, about 16 students were appointed each semester as project assistants, research assistants, or teaching assistants, or they received fellowship support. Students with assistantships, and in some cases fellowships, pay no university tuition.

building internal and external networks

a center focused on building internal & external networks

Part of the underlying philosophy of the Erdman Center is to expose MTM students to industrial practices and processes. Current industrial thinking is, therefore, brought into the learning experience in several ways. Specifically, the opportunity to meet and exchange ideas with the managers of business processes is important to the grooming of future managers. The Center also strives to create a feeling of cohesiveness among the MTM students. To achieve these goals, the Center organizes the following activities:

Orientation sessions: New and returning students meet at the beginning of the semester to get ready for the upcoming semester. Topics discussed include program philosophy, curriculum, and important events during the semester.

Guest speakers and field trips: Members from the Industrial Advisory Board, and other industry contacts, assist the Center by serving as guest speakers or hosting field trips. The Center also organizes field trips to regional or national firms.

Short courses: Students have the opportunity to attend short courses (one to three days) for business professionals offered by the Executive Education arm of the School of Business and the Quick Response Manufacturing Center.

MTM Seminar Series: The purpose of the Seminar Series is to expose the students to modern technologies and their adoption, new ways of organizing and managing firms, and current

industrial perspectives by management and labor on these issues. The seminar can also include “best-practice” field trips.

Semi-annual board dinners and meetings: The Center holds two board meetings a year, with a preceding dinner. These meetings serve as a valuable opportunity for the students to interact with the Board members.

Student development workshops: The Center arranges and/or promotes workshops to help prepare MTM students for their careers. In the past, workshops in presentation skills, intercultural communication, negotiating salaries, case interviewing, and mock interviews have been offered – some in conjunction with the Business Career Center and Engineering Career Services.

Social gatherings: The Center arranges end-of-semester graduation parties for the MTM students each May and December. In addition, we regularly arrange other social events aimed at reinforcing the network among the MTM students, staff, and Advisory Board. Joint participation in community outreach projects is also encouraged.

Student Roundtable: The purpose of the Roundtable, arranged once or twice per year, is to seek feedback from all MTM students about their educational experiences and job-seeking efforts. This allows the Center to build on the strengths and improve any weaknesses of the program, curriculum, and/or the school.

field trips

mtm field trips

“It is the first time that I have observed cellular manufacturing. I learned the layout as well as how the process was organized.”



The MTM Group on their 'best practices road trip,' pictured here on location at Dell and DuPont in Austin, Texas.

This spring, our regular MTM Spring Seminar Series was anything but a typical classroom seminar. Due to the generosity of the Ford Motor Company, we were able to go on the road. Three students were coordinators of the MTM Travel Agency and with their help we were able to organize a major road trip to places we thought showcased “best practices in manufacturing.” Our first trip, in October, was to GE Medical MRI in Waukesha, WI. In March, MTM visited manufacturers in Mexico and Texas on our annual “best-practices” road trip.

Fourteen students in the MTM Program participated in the MTM Best Practices Road Trip during March 2002. The trip, which was co-sponsored by CIBER and the Ford Motor Company, took stu-

dents to Mexico and Texas. The purpose of the trip was to help students learn about and experience hands-on the best practices of a variety of types of manufacturers with a wide range of products. The trip focused on visits to several companies located in Mexico, including Vitro, a glass manufacturer; *El Norte*, a newspaper producer; *Cerveceria Cauhtemoc Moctezuma*, a brewery; and *Vanity Fair*, an apparel manufacturer. The group also visited three companies, Dell, Applied Materials, and DuPont Photomasks, Inc. (DPI), in Austin, Texas.

In addition to going on a tour of each facility, the students participated in discussions with managers, engineers, and researchers at the various companies. They were able to learn about the

“We got the chance to see the by-the-book recommended operation management style in real life.”



Tec de Monterrey (ITESM) and the MTM group at Vitro in Monterrey, Mexico.

history of each company, as well as supplier relationships, international trade concerns, quality challenges, and how the current global economy affects each business.

Each manufacturer presented students with a different example of production. For example, the Rey-Mex Bra plant (owned by Vanity Fair) in Reynosa, Mexico, is located close to the U.S. border in the “maquiladora” region of Mexico. By locating an assembly plant in this region, Vanity Fair enjoys reduced import duties and relatively inexpensive labor costs. The plant has 600 employees and produces roughly 1,000 units per day. About half of these garments are produced for Vanity Fair brands and the other half are produced for outside private labels such

as Victoria’s Secret and Express. During the plant tour, students observed the implementation of a modular, team-based assembly line. In addition to touring the facility, students had an opportunity to discuss operations with the plant and production managers. Topics of discussion included individual versus team incentives, employee training and retention, and production planning.

At Dell Computers in Austin, Texas, the students were able to talk to UW-Madison alumni who now work at Dell. This personal feedback gave the students examples of possible practical applications of the skills they are gaining through the MTM program. It also provided them with an intimate, in-depth look at the manufacturing and distribution processes practiced at Dell.

students

students enrolled july 2001 — june 2002

NEW STUDENTS



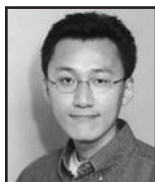
Melissa Anderson

B.S. Industrial Engineering,
UW-Madison
Previously employed by Juneau Partners,
Inc. as a Senior Consultant
Internship 2002: Harley-Davidson,
Milwaukee, WI



Chia-Ping Chan

B.S. Industrial Engineering Chung Yuan
Christian University, Taiwan
Previously employed by Lucent
Technologies as a Manufacturing
Engineer
Internship 2002: Parts Now!,
Madison, WI



Jinwook Chung

M.S. Organic Chemistry,
Seoul National University, South Korea
B.S. in Chemistry, Seoul National
University, South Korea
Previously employed by Oh-Young
Industrial Company as a General man-
ager of Manufacture Planning
Internship 2002: Big-Bio Co.,
South Korea



Shailesh Ghimire

B.A. Physics, Whitworth College,
Previously employed by Nicolet
Technologies as an Applications
Engineer



James Lang

B.S. Zoology and Biological Sciences,
Colorado State University, Fort Collins,
Colorado
Previously employed by OnIT Consulting
as an IT Consultant
Internship 2002: Breakthrough
Development LLC., Madison, WI

Qasim Munir

B.S. Chemical Engineering,
University of Engineering and
Technology, Pakistan
Previously employed by Engo Chemical
Pakistan LTD (Exxon Chemical) as a
Senior Process/Contact Engineer
Internship 2002: UW-Madison
Department of Astronomy



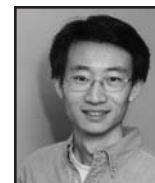
Yuri Ramirez

Ph.D. Industrial Engineering (in
progress), UW-Madison
B.S. in Industrial Engineering, University
of Puerto Rico
Previously employed by Hewlett-Packard
as a Design Product Consultant



Jian Sun

B.S. Biotechnology and Science,
Nanjing University, China
Previously employed by Motorola
Electronics as a Project Manager in the
Systems Support Division
Internship 2002: Valspar,
Minneapolis, MN



Michael Wirth

M.S. Electrical Engineering,
UW-Madison
B.S. in Electrical Engineering,
Milwaukee School of Engineering,
Milwaukee, WI
Previously employed by MSOE as a
Special Project Research Engineer in the
Rapid Prototyping Center; UW-Madison
as a Graduate Research Assistant in the
High Power Microwave Laboratory
Internship 2002: Rayovac, Madison, WI



RETURNING STUDENTS



Nathan Blair

*B.A. Physics
Gustavus Adolphus College,
M.S. Mechanical Engineering
University of Wisconsin-Madison,
Internship 2000: Sandia National
Laboratory, Albuquerque, NM
Internship 2001: Global Energy Partners,
Lafayette, CA
Graduated May 2002
Full-time position: National Renewable
Energy Laboratory, Golden, CO*



Matt Bohlman

*B.S. Biochemistry
UW-Madison,
Internship 2001: WARF, Madison, WI
(on leave from the MBA program)*



Leonel Preza Bonilla

*B.S. Mechanical and Business
Engineering
ITESM, Monterrey Tech, Mexico,
Internship 2001: Johnson Wax,
Sturtevant, WI
Graduated May 2002
Full-time position: Fresco Group
Americas, El Salvador*



Vivek Dubey

*B.S. Mechanical Engineering
Visvesvaraya Regional College of
Engineering, India, M.S. Aerospace
Engineering
Oklahoma State University,
Internship 2001: 3M, St. Paul, MN
Internship 2002: Datex-Ohmeda,
Madison, WI*



Patrick Kirsop

*B.S. Engineering
University of Wisconsin-Milwaukee, MSc
Environmental Health Sciences, Harvard
University School of Public Health,
Graduated May 2002
Full-time position: Department of Natural
Resources, State of WI*

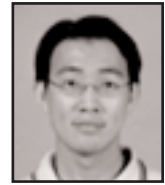


Brian Larson

*B.S. Industrial Engineering
University of Wisconsin-Madison,
Internship 2000: Rayovac Corporation,
Fennimore, WI
Internship 2001: Rayovac Corporation,
Madison, WI
Graduated December 2001
Full-time position: Sonoco, Wausau, WI*

Hsi-Hsien (James) Liang

*B.S. Power Mechanical Engineering,
M.S. Power Mechanical Engineering,
National Tsing Hua University, Taiwan
Internship 2001: Ford Motor Company,
Taiwan
Will graduate August 2002
Full-time position: EPIC, Madison, WI*



Ernest Nicolas

*B.S. Manufacturing Systems Engineering
Kettering University/GMI Engineering
and Management Institute,
Internship 2001: General Motors,
Detroit, MI
Will graduate August 2002
Full-time position: GM, Janesville, WI*



Sanjay Rao

*B.E. Mechanical Engineering
Coimbatore Institute of Technology,
Bharathiyar University, India,
Internship 2001: Johnson Wax,
Sturtevant, WI
Graduated May 2002
Internship 2002: Lands' End, Dodgeville,
WI*



WeiQi Sa

*B.S. Biochemical Engineering,
M.S. Biochemical Engineering, East
China University of Chemical Technology
Internship 2001: Promega, Madison, WI
Graduated May 2002
Full-time Project: Breakthrough
Development LLC., Madison, WI*



Marni Sauer

*B.S. Neurobiology and Physiology
Purdue University
Full-time position: Promega, Madison, WI*



Arun Sharma

*B.E. Mechanical Engineering
Delhi University, Delhi, India,
Internship 2000: Promega, Madison, WI
Internship 2001 and 2002:
Datex-Ohmeda, Madison, WI
Will graduate August 2002*



Joe Uhlik

*B.S. Manufacturing Engineering
Technology
California Polytechnic State University,
San Luis Obispo, CA,
Internship 2001: TECO, Madison, WI
Will graduate December 2002*



summer internships

s u m m e r i n t e r n s h i p s

Summer internships are expected of all full-time students between the first and second year, and are designed to provide first-hand experience in management issues and/or the operation of a manufacturing company. Students gain not only valuable experience working in areas of interest; they also acquire a unique combination of skills that prepares them for leadership positions in management or consulting. All MTM students to date pursuing internships have been placed.

SUMMER 2002 INTERNSHIPS

Rayovac, Madison, WI*
Datex-Ohmeda, Madison, WI*
UW-Madison Dept. of Astronomy, Madison, WI
Harley-Davidson, Milwaukee, WI*
Big Bio Company, South Korea
Breakthrough Development LLC, Madison, WI*
Parts Now!, Madison, WI*
Valspar, Minneapolis, MN

SUMMER 2001 INTERNSHIPS

3M, St. Paul, MN*
Ford Motor Company, Taiwan
Global Energy Partners, Lafayette, CA
Johnson Wax (2 students), Sturtevant, WI
Promega, Madison, WI*
Rayovac, Madison, WI*
TECO, Madison, WI
WARF, Madison, WI*

*Industrial Board Member companies

industrial advisory board news

i n d u s t r i a l a d v i s o r y b o a r d n e w s

The Advisory Board meeting in November 2001 was dedicated to the important task of re-visiting and reformulating the MTM mission and vision. The Spring Advisory Board meeting in April 2002 started off with an exercise on teamwork and decision-making. Discussion then turned to the current economic situation and the job market. Two MTM students also shared their student project presentations.

Two Board members were guest lecturers in the OIM classes. Featured Board members included Merle Clewett, former president of Ingersoll Cutting Tools, Rockford, IL, in October and Robert Bullis, VP manufacturing, Badger Meter, Milwaukee, WI, in December. Many thanks for these well-delivered and popular presentations.

Joining the Board this year:

Dan Olszewski, CEO at PARTS NOW!; Ron Cipolla, CIO at Marshall Erdman & Associates; Paul Shave, VP Supply Chain – Worldwide Operations at Mercury Marine; and Rod Drummond, president & COO North American Operations at Ingersoll International Inc.

Continuing on the Board in new positions this year:

Gene Berg became executive VP and COO of Austin-Westran Inc., Greg Van Grinsven is now plant manager, John Deere Turf Care in North Carolina; Joe Bulat became director of global procurement & supply systems at DaimlerChrysler; Jorge Hidalgo became VP of York Vehicle Assembly for Harley-Davidson in York, Pennsylvania.

Past service to the Board:

Ron Mengel resigned as VP of engineering at Johnson & Johnson/McNeil Consumer Products and moved out West.

industrial advisory board

industrial advisory board (july 2001-june 2002)

The Industrial Advisory Board members serve as external partners of the Center by monitoring industry trends and changes that may have important implications to the Center and the MTM program. The main purpose of the Board is to provide recommendations and advice to the Academic Advisory Board on matters vital to the Center's activities. Board members also serve as mentors for the MTM students and invite them to do project work or summer internships.

Tom Arenberg
Partner
Accenture

Gene Berg
President
Chief Operating
Officer
Austin-Westran

Judy Benham
Technical Director,
Packaging
3M Corporation

Kenneth Biller
Executive Vice
President, Operations
**Rayovac
Corporation**

Greg Brown
Former President
**Suntec Industries,
Inc.**

Joe Bulat
Director, Global
Procurement & Supply
Systems
DaimlerChrysler

Robert Bullis
Vice President of
Operations
Badger Meter Inc.

Ron Cipolla
Chief Information
Officer
**Marshall Erdman
& Associates**

Rod Drummond
President & COO –
North American
Operations
**Ingersoll Cutting
Tool Company**

Tom Evans
Vice President of
Operations
Promega

Carl Gulbrandsen
Director of Patents and
Licensing
**Wisconsin Alumni
Research
Foundation**

Jorge Hidalgo
VP of York Vehicle
Assembly
**Harley-Davidson,
Inc.**

Philip Jones
Hanson Professor of
Manufacturing
Productivity
Henry B. Tippie
College of Business
University of Iowa

John LaBella
Director, Supply Chain
Methods and
Applications
Kraft Foods

Ron Mengel
Vice President of
Engineering
**Johnson &
Johnson/McNeil
Consumer Products**
(retired May 2002)

Brian Mitchard
Director of Operations
- Medical Systems
Division
Datex-Ohmeda

Jerry Oleston
Director of Engineering
General Motors

Dan Olszewski
Chief Executive Officer
Parts Now!

Jay Petersen
Partner
**Deloitte & Touche
LLP**

Paul Shave
Vice President Supply
Chain – Worldwide
Operations
Mercury Marine

Jim Timmins
President
**Breakthrough
Development LLC**

Greg Van Grinsven
Plant Manager, John
Deere Turf Care
Deere & Co.

research

faculty research

The mission of the Erdman Center is to become recognized as a focal point for industry-grounded research on the management of manufacturing and technology-based firms. This is to be accomplished through the support of leading-edge research that expands current knowledge of the theory and practice of managing organizations. The Center's goal is to become active in the funding of research conducted by faculty and students.

The Center is co-sponsoring *Manufacturing & Service Operations Management* – a premier research journal in the field (www.mgmt.purdue.edu/msom).

Recent research publications, work in progress, and presentations by faculty affiliated with the Manufacturing and Technology Management area are listed as follows:

Kathryn Caggiano

Caggiano, K.E. and P. L. Jackson, "Cyclic Scheduling with Acyclic Job Precedence Constraints: Construction Heuristics," Working Paper, 2002.

Caggiano, K.E. and P. L. Jackson, "Cyclic Scheduling with Acyclic Job Precedence Constraints: Improvement Heuristics," Working Paper, 2002.

Caggiano, K.E., J.A. Muckstadt, and J.A. Rappold, "Real-time Capacity and Inventory Allocation for Repairables in a Two-Echelon System with Emergency Shipments," Working Paper, 2002.

Caggiano, K.E., J.A. Muckstadt, and J.A. Rappold, "A Simple Algorithm for Part Stocking to Satisfy Pooled Customer Service Requirements at Minimum Cost," Working Paper, 2002.

Caggiano, K.E., P.L. Jackson, J.A. Muckstadt, and J.A. Rappold, "A Multi-Echelon, Multi-Item Inventory Model for Service Parts Management with Generalized Service Level Constraints," submitted to *Operations Research*, 2001.

Caggiano, K.E., P.L. Jackson, J.A. Muckstadt, and J.A. Rappold, "Optimal Stocking in Repairable Parts Networks with Pooling," submitted to *Naval Research Logistics*, 2001.

Caggiano, K.E. and J.A. Muckstadt, "A Combinatorial Multi-Indenture, Multi-Item Inventory Model for NASA's Reusable Launch Vehicle Program," under revision for *Operations Research*.

Presentations:

"A Multi-Echelon, Multi-Item Inventory Model for Service Parts Management with Generalized Service Level Constraints," Twenty-Fifth Anniversary Multi-Echelon Inventory Conference, Johnson Graduate School of Management, Cornell University, June 2002.

"Maintenance Support for the Reusable Launch Vehicle Program: Determining and Evaluating Spare Stock Levels for Recoverable Parts," presented at numerous academic institutions, November 2000 – February 2001.

Mark Finster

Finster, Mark P. 2001. "Creating Continuous Innovation." *Quality Management Journal*, Vol. 8, No. 4, pp 22–26.

Finster, Mark P., Pat Eagan and Dennis Hussey. "Linking Industrial Ecology with Business Strategy: Creating Value for Green Product Design." *Journal of Industrial Ecology*, Vol. 5, No. 3, pp 89–107.

Eagan, Pat, Mark P. Finster and Dennis Hussey. 2001. "Clarifying the Environmental Voice of the Customer Using the Kano Technique." Proceedings of EcoDesign 2001: Second International Symposium on Environmentally Conscious Design and Inverse Manufacturing, Tokyo, Japan, December 11–15, 2001, pp. 842-847.

Timothy McClurg

McClurg, T. and S. Chand, "A Parallel Machine Replacement Model," *Naval Research Logistics*, 2002, Vol. 49, 275–287.

Weng, K. and T. McClurg, "Coordinated Ordering Decisions for Short Life Cycle Products with Uncertainty in Order-Delivery Time and Demand," forthcoming in *European Journal of Operational Research*.

James Rappold

Muckstadt, J.A., D.H. Murray, J.A. Rappold, and D.E. Collins, "Guidelines for Collaborative Supply Chain System Design and Operation," *Information Systems Frontiers: Special Issue on Supply Chain Management*, 3(4), 427–453, 2001.

research

faculty research

Muckstadt, J.A., D.H. Murray, and J.A. Rappold, "Capacitated Production Planning and Inventory Control when Demand is Unpredictable for Most Items: The No B/C Strategy," under review.

Caggiano, K.E., P.L. Jackson, J.A. Muckstadt, and J.A. Rappold, "A Multi-echelon, Multi-item Inventory Model for Service Parts Management with Generalized Service Level Constraints," under review.

Caggiano, K.E., P.L. Jackson, J.A. Muckstadt, and J.A. Rappold, "Optimal Stocking in Repairable Parts Networks with Repair Capacity and Inventory Pooling," under review.

Chan, E.W., J.A. Muckstadt, and J.A. Rappold, "Determining and Allocating Capacity-Driven Safety Stock in Multi-echelon Capacitated Production-Distribution Systems," under review.

Caggiano, K.E., J.A. Muckstadt, and J.A. Rappold, "Real-Time Capacity and Inventory Allocation Decisions for Repairables in a Two-Echelon System with Expedited Shipments," in progress.

Caggiano, K.E., P.L. Jackson, J.A. Muckstadt, and J.A. Rappold, "A Simple Algorithm for Part Stocking to Satisfy Pooled Customer Service Requirements at Minimum Cost," in progress.

Muckstadt, J.A., D.H. Murray, and J.A. Rappold, "Base Stock Levels in Production-Distribution Systems with Cyclic Stochastic Demand," in progress.

Rappold, J.A. and A. Resnick, "Determining Optimal Component Inventory Levels in Large-Scale Assembly Environments," in progress.

Presentations:

"Applying Supply Chain Thinking in an E-Commerce Environment," presented at the Council of Logistics Management, January 2001.

"Guidelines for Collaborative Supply Chain System Design and Operation," presented at the National Institute of Standards and Technology, April 2001.

"B2B E-Procurement and Supply Chain Management," presented at the Consortium for Global Electronic Commerce, September 2001.

"Models for Optimizing Component Safety Stock Levels in Large-Scale Assembly Systems," presented at the RAND Corporation, June 2002.

"A Multi-echelon, Multi-item Inventory Model for Service Parts Management with Generalized Service Level Constraints," presented at the Multi-Echelon Inventory Conference, June 2002.

"Optimal Stocking in Repairable Parts Networks with Repair Capacity and Inventory Pooling," presented at the Manufacturing and Service Operations Management Conference, June 2002.

"Real-Time Capacity and Inventory Allocation Decisions for Repairables in a Two-Echelon System with Expedited Shipments," presented at the Manufacturing and Service Operations Management Conference, June 2002.

Urban Wemmerlöv

Hyer, N. and Wemmerlöv, U., *Reorganizing the Factory: Competing through Cellular Manufacturing*, Productivity Press, Portland, OR (770 pages; published in December 2001 with a 2002 copyright). This book contains several new research contributions, some of which have been presented at academic conferences.

Presentations:

Johnson, D. and Wemmerlöv, U., "Improving Manufacturing Performance: Conditions Favoring the Use of Cellular Manufacturing," Annual Meeting of the Decision Sciences Institute, San Francisco, CA, November 22, 2001.

Wemmerlöv, U. and Hyer, N.L., "Teaching Factory Management Using a Cellular Manufacturing Framework," Production and Operations Management Society-POMS (Twelfth Annual Meeting), San Francisco, CA, April 7, 2002.

Hua, S. and Wemmerlöv, U., "Sequential Product Development and Market Performance: An Empirical Investigation of the PC Industry," Production and Operations Management Society-POMS (Twelfth Annual Meeting), San Francisco, CA, April 7, 2002.

Kevin Weng

Weng, K. and M. Parlar. "Price Incentives, Demand Information Updating and Stocking for Short Life-Cycle Products." (Submitted to *Management Science*)

Weng, K. and T. McClurg. "Coordinated Ordering Decisions for Short Life Cycle Products with Uncertainty in Delivery Time and Demand." (Submitted to *European Journal of Operational Research*)

Weng, K. "Coordination under Production and Demand Uncertainty: A Practical Book Printing Problem and General Insights." (Submitted to *IIE Transactions*)

Webster, S. and K. Weng. "Improving Repetitive Manufacturing Systems: Models and Insights." *Operations Research* 2001, 49:1, 99-106.

Webster, S. and K. Weng. "The Net Effect of Introducing Competition between Two Suppliers by the Manufacturer: A theory." (Submitted to *IIE Transactions*)

Weng, K. "Consolidating Supply with Substitutable Items and Finite Production Capacity." (Submitted to *Naval Research Logistics*)

Parlar, M. and K. Weng. "Vertical Coordination of Pricing and Production Decisions to Hedge against Horizontal Price Competition." (Submitted to *European Journal of Operational Research*)

Webster, S. and K. Weng. "The Role of Coordination in Supply Chain Management." (Submitted to: *IIE Transactions*)

Presentations:

Weng, K. "Balancing Desirable but Conflicting Objectives for Short Life-Cycle Products." INFORMS National Meeting, Miami Beach, FL., November 2001.

Rajan Suri

S. Bhaskar, R. Suri and E.M. Matsumura, "Inefficiency and Asymptotic Instability of the Time-Based Costing Scheme", Working paper, Center for Quick Response Manufacturing, University of Wisconsin-Madison, March 2001.

B.R. Fu, L. Shi and R. Suri, "Analysis of Departure Times in Discrete and Continuous Tandem Production Lines," *Journal of Discrete Event Dynamic Systems*, Vol.12, No.2, April 2002, pp.159-186.

R. Suri, "QRM Extends Lean to Low-Volume and Custom Products," *Lean Directions: the e-Newsletter of Lean Manufacturing*, Society of Manufacturing Engineers, October 2001.

R. Suri, F. Rath and T. Dewar (Eds.). *Proceedings of QRM 2001: The Second Annual Conference on Quick Response Manufacturing*, Center for Quick Response Manufacturing, October 2001.

R. Suri, "POLCA: The Material Control Strategy for High Mix or Custom-Engineered Products", in *Proceedings of QRM 2001: The Second Annual Conference on Quick Response Manufacturing*, Center for Quick Response Manufacturing, October 2001.

center staff and academic advisory board

center staff and academic advisory board



Urban Wemmerlöv
Kress Family Wisconsin
Distinguished Professor
Center Director

Raj Veeramani
Professor, Industrial
Engineering
Director, Consortium for
Global Electronic
Commerce
College of Engineering
Academic Advisory Board



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Information Mgmt.
School of Business
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Carol A. Aspinwall
Assistant Center Director
School of Business



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Professor
Management and Human
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Kinsey Heyerdahl
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School of Business



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