A Look Back . . .

Penn State Smeal Supply Chain Program
Introduction

“When you are through changing, you are through.”

Bruce Barton (1886-1967), advertising executive, U.S. Congressman, Presidential advisor

The history of the supply chain program at Penn State is a history of continuous change—moving from a post-World War II focus on the logistics of transportation, warehousing, and inventory management, to a broadened view incorporating sourcing and distribution, to a holistic vision of supply chain as an end-to-end collaborative enterprise. The capstone course in supply chain studies used to be network design and strategy, focusing on the number, location, and linkages of fixed facilities. Today, the big strategic issues are supply chain transformation, leadership, sustainability, and innovation.

The trajectory of supply chain research and studies at Penn State has mirrored the movement in industry from the marketing model of “product, price, promotion, and place” to the perception of supply chain as a strategic competency. This change in thinking among corporate executives has led to increased collaboration with suppliers, in turn leading to greater emphasis on quality, more innovative product design, and increased cost savings and revenues. Now when a product is designed, executives think about the entire supply chain, from collaborating with raw materials suppliers to communicating with the customer.

Today’s CEOs see effective supply chain management as the key to keeping a competitive edge, and they know that even with the best processes in place, competitive edge also depends on the intangibles, such as a workforce with the talent, drive, and passion for continuous learning. The demand for top-notch supply chain professionals has grown tremendously, and many companies look to Penn State to help with the current talent gap. As one industry professional notes, “When Penn State graduates work in industry, seeing firsthand the impact of supply chain on information flow and cash flow, they are adept at understanding and adapting to change.”

Researchers, educators, students, and industry practitioners—key stakeholders in the Penn State supply chain program—have contributed immeasurably to its success. The pages that follow serve as a record of the program’s milestones and achievements:

The first section, “A Historical Overview,” places the record in context, tracing the evolution of the program as a creative, affirmative response to changing market forces and resulting educational needs.

The second section, “Supply Chain Program at Smeal College of Business,” paints a present-day portrait of the two driving forces in the program: “Center for Supply Chain Research” and “Department of Supply Chain and Information Systems.”

The final section, “Emerging Issues in Supply Chain Management,” highlights current and upcoming areas of importance in the field of supply chain management, and points to the growing need for a well-educated supply chain workforce.
A Historical Overview

1950s

In 1953, Malcolm McLean sat at the desk of his North Carolina trucking company working out an idea that had struck him in his days as a long-haul trucker: how to move a shipment of goods directly from truck to ship. His solution, known today as containerized shipping, would revolutionize international commerce.

That same year, Penn State president Milton S. Eisenhower, acting on his mandate to bring national recognition to the university, founded its first school of business. Today, the internationally ranked Mary Jean and Frank P. Smeal College of Business has a worldwide alumni base of 73,000, an enduring testament to its passionate commitment to preparing students.

At the beginning of the 1950s, there were more than 150 business schools in the United States, with most students attending school close to home and higher-level course offerings shaped largely by local companies. By the end of the decade, the first commercial computer was in use, the first successful high-level programming language was developed, and the integrated circuit was invented. And business schools—with a massive infusion of funding from the Ford Foundation—shifted their focus from a vocational, training emphasis to a more analytic and research-based approach. Penn State’s College of Business established departments of Accounting, Economics, and Commerce, developed a Master of Business Administration program, and delivered its first executive management program.

1960s

The 1960s were a time of great economic expansion in the United States, marked by rapid advances in computer technology, including development of new programming languages and invention of the first commercial modem, first industrial robot, computer virtual memory, and computer-aided design.

As new technologies created a growing demand for a more educated workforce, Penn State undertook a university-wide reorganization. Economics was moved to the College of the Liberal Arts; management studies were split off from Commerce to form a separate department in the College of Business incorporating studies in general management, personnel, and business policy.

Within the new Management Department, undergraduate and graduate courses in operations management were developed, studies in organizational behavior were strengthened, and management science and simulation courses were added.

At the same time, the Accounting Department began developing the business statistics area (soon to be known as Quantitative Business Analysis, or QBA), and the College—building on its keystone major in transportation and distribution—established the nation’s first independent Department of Business Logistics. By the end of the sixties, the College of Business also included departments of Finance, Marketing, Insurance, and Real Estate.

Penn State Executive Programs flourished in the sixties, introducing organizations to new business strategies and develop leaders within the workforce.

1970s

In the 1970s, in the wake of gasoline shortages, soaring inflation, and increasing regulatory control of commerce, corporations adopted new communications strategies to boost public confidence in the free enterprise system. Business schools nationwide began to incorporate communications programs into their curricula.

The decade also witnessed a continued flow of advances in computer technology, including introduction of the first commercially available dynamic RAM chip; invention of the first
consumer computers, microprocessor, and floppy disk; and development of spreadsheet software and ethernet computer networking. The advances took the workplace by storm while at the same time creating a growing communications gap between the creators of commercial applications and their users: computer programmers and business people. Higher education responded, and the field of Management Information Systems (MIS) studies was born.

Early in the seventies at Penn State, MIS and Accounting merged to form the new Department of Accounting and Management Information Systems, and QBA studies were merged with the Management Department to form the new Department of Management Science and Organizational Behavior (MSOB). Later in the decade MSOB was split into two departments, and the Management Science Department was established.

In the 1970s and 1980s, as businesses placed increasing emphasis on the development of purchasing strategies tied to supply management, the Penn State College of Business responded by expanding its course offerings in procurement and logistics.

1980s

By the time the 1980s arrived, containerization had dramatically reduced the cost of transporting goods and the associated risks of breakage and theft. Fax capability and other improvements in long-distance telephone capability now enabled cost-effective real-time communications between businesses separated by miles or continents. Barcoding had become a boon to efficient inventory management. And “lean production,” arising from a reduced need to carry inventory, had become the industry standard.

In 1982, the term supply chain was coined, reflecting an increasing focus on the complete chain of processes needed to bring goods and services to market, from sourcing to production to delivery to sales.

The eighties saw increasingly modularized production systems, expanding beyond the automobile industry to electronics and other industries, and third-party logistics providers became more prevalent. Radio frequency identification (RFID) tags enabled rapid scanning of merchandise while communicating point-of-sale data directly to retailers and product manufacturers. And a staggeringly large new world market opened with China’s move to become more mercantile.

Spurred by technological advancement and ever-increasing global competition, the late eighties ushered in an era of tremendous growth in employment opportunities nationwide. Business leaders looking for innovative ways to keep their workforces at the top of their game took a renewed interest in forming strong alliances with public education.

Business schools responded by expanding course offerings in adult business education and creating new venues for their delivery. Penn State was once again at the forefront. Already a force in executive education, the College of Business also began offering credit-bearing correspondence courses in business, building on the university’s strong tradition of distance learning that began fully a century earlier with correspondence courses in agriculture. Long-time business professor John Coyle spearheaded the effort, a tireless advocate of Penn State business studies and of fostering strong ties with the industries they serve.

Coyle’s fellow faculty members, recognizing the need for a center for logistics research, recommended him to lead the charge. In 1989 Coyle founded the Center for Logistics Research (renamed in 2001 as the Center for Supply Chain Research). Coyle chose William “Skip” Grenoble, then a star Ph.D. student, as the Center’s administrative director, in charge of corporate relations. Under the leadership of Grenoble, now Executive Director of the Center, corporate sponsorships have grown from one—Conrail was the first—to 50. The Center’s first research project, funded by the
Council for Logistics Management, was an in-depth study of logistical needs in the service industries, including health care, banking, and product services.

1990s

The decade of the 1990s saw the longest period of economic expansion in the history of the United States, driven in large part by globalization and a technological revolution. Desktop computers became popular for both home and office use; mobile telephones were everywhere; and by mid-decade the internet allowed free access to all users. Electronic mail and instant messaging soon followed, and real-time communication became the order of the day.

Sweeping advances in communications technology drove greater efficiencies in manufacturing and transportation networks, and businesses ratcheted up productivity to meet the accelerating demand for hardware, software, and telecommunications components. “Just-in-Time” inventory and distribution systems were widely adopted by industry, and processes along the supply chain were increasingly outsourced. The era of the superstore began, and consumers entered a world of unprecedented choice at affordable prices.

In the early 1990s Grenoble was part of a preliminary committee sponsored by PRTM and AMR. The committee developed the original framework and metrics formats for what would later become the Supply Chain Operations Reference (SCOR®) model—for defining and linking performance metrics, processes, best practices, and people. SCOR would soon become the industry gold standard for evaluating supply chain activities and performances.

In 1996, a consortium of 69 organizations formed the Supply Chain Council. Grenoble became the first academic serving on the Supply Chain Council Board of Directors, the North American Leadership Team, and the Training and Education Committee of the Supply Chain Council.

In the early nineties, the Department of Management Science and Information Systems (MS&IS) was formed, offering undergraduate and graduate courses in management science, operations management, and information systems, with additional faculty specialties in business statistics, decision analysis and game theory, and operations research. A core doctoral program for the new department was developed, and a number of research centers were created to bring faculty together around their shared interests.

The nineties were also a hallmark decade for supply chain studies and research within the Mary Jean and Frank P. Smeal College of Business. The Center for Supply Chain Research attracted its first corporate sponsor, saw publication of its first major research project, delivered its first customized executive supply-chain education program, established its first two benchmarking consortia (import processes and customer service), and held its first Leaders Forum for corporate executives. In a 1995 Journal of Business Logistics article, Penn State’s Department of Business Logistics was ranked the best in the nation.

By the end of the nineties, the Department of Business Logistics and the Center for Supply Chain Research had worked with diverse companies to deliver courses on site in combination with two-way interactive video. Led by the driving efforts of Professor John “Gene” Tyworth, the Department also made its mark as one of the first in the nation to offer online business programs through the newly organized Penn State World Campus with graduate and undergraduate certificate courses in Supply Chain Management. Tyworth served as director of these programs until 2008.
The New Millennium

By the time the new millennium arrived, environmental problems were on a global scale, but the overall economic picture of the United States looked healthy, with an increase in real output, unemployment rates below 5%, and a stock market still soaring from the dot-com boom. Within two years, everything changed, some say as a result of the September 11, 2001, attacks on the World Trade Center: output languished, unemployment climbed, and businesses failed in alarming numbers. Not long after, corporate scandals rocked Wall Street.

Then in 2008, in the wake of the U.S. housing market collapse, the stock market plummeted and large financial institutions in the U.S. and Europe closed their doors. The Great Recession had hit, and hit hard. During this same time period, however, some nations prospered. Chief among these were the “BRIC” countries (Brazil, Russia, India, and China), which became major players in the international marketplace. On the technology front, blogs and social media sites proliferated; videos and photographs could be shared among friends in real time; and music, books, and film could be purchased and enjoyed online.

Increased environmental awareness, heightened concern for personal and public safety, and widespread computer use in nearly every aspect of our lives changed how industry views business operations. The view today is a holistic one, encompassing the entire end-to-end process of bringing a product or service to market and beyond. It takes into consideration such issues as recycling and sustainability, product recalls practices and processes, catastrophic risk management, internet marketing and advertising, online learning, and the use of social media to interface directly with consumers. And it reflects widespread recognition of supply chain management as a core area of business studies in the twenty-first century.

In 2002, the Smeal College of Business responded to industry needs by creating the Department of Supply Chain and Information Systems (SC&IS), through a merger of the Department of Business Logistics and
Supply Chain Program at Smeal College of Business

Center for Supply Chain Research

Widely regarded as a preeminent research institute, the Penn State Center for Supply Chain Research (CSCR) is a leading source of supply chain knowledge creation and dissemination. Its activities and agenda aim to enhance the body of knowledge in all major facets of supply chain management. Its insights are targeted to a community of scholars and practitioners dedicated to shaping global supply chain management. And its brand, simply put, is excellence.

“The Center continually adapts to the needs of industry practitioners. One of the biggest challenges for any company today is navigating the constantly changing waters of the global economy—keeping abreast of changes in the market and supply conditions, reaching the increasingly independent online consumer, and more. At CSCR, we help businesses meet such challenges, always keeping an eye on the big picture but never losing sight of the details that are vital to operational success and a healthy bottom line.”

John Coyle, Professor Emeritus of Business Administration, Director of Corporate Sponsors for the Center for Supply Chain Research and founding Executive Director, Center for Supply Chain Research

The Center for Supply Chain Research focuses its efforts in four major areas: research, corporate sponsorship, benchmarking, and executive education.

Research

CSCR’s primary interest is in important emerging areas of supply chain research. The Center works in conjunction with faculty members from the Department of Supply Chain and Information Systems as well as other departments within the Smeal College of Business.

CSCR affiliates also include faculty specialists from other colleges at Penn State, collaborative colleagues from other universities, and interested industry practitioners. Their combined expertise—in such fields as management science, operations management, industrial and manufacturing engineering, international business, business law, communications, geography, agricultural economics, MIS, and finance—gives tremendous depth and breadth to the scope of Center research. It is a key component of Penn State’s unparalleled model of integrated supply chain research and education.

“Our brand is one of our biggest assets. We have a very diverse department, in specialties, research interests, and backgrounds. From an education viewpoint, we are one-stop shopping: bachelor’s program, executive education, master’s program . . . The success of our programs is significantly explained by the number of ‘program builders’ we have had from the beginning—teaching and research faculty who are passionate and unwavering in what they do.”

Christopher Craighead, Rothkopf Professor and Associate Professor of Supply Chain Management, Director of Research, Center for Supply Chain Research

CSCR research focuses on emerging research areas relative to all major facets of supply chain management providing insights targeted to both academic and managerial audiences.
Corporate Sponsorship

CSCR seeks to attract outstanding corporate sponsors with the aim of building lasting research and education partnerships. The Corporate Sponsorship Program gives business leaders a powerful way to stay on top of trends, challenges, and solutions in supply chain management.

“The sponsor relationships are critical. Sponsors influence the Center’s research initiatives by identifying supply chain issues that are important in the current business environment. This process addresses the needs of supply chain professionals while encouraging researchers to advance the state of scholarship in the field.”

William ‘Skip’ Grenoble, Executive Director, Center for Supply Chain Research

Advisory Meetings

Corporate sponsors are invited to participate in two yearly advisory meetings at the Center for Supply Chain Research, to learn about upcoming activities of the Center and recommend topics for the Supply Chain Leaders Forums and other executive education venues.

Research

Corporate sponsors can influence the CSCR research agenda and gain priority access to current research. Sponsors are also invited to submit industry research requests that match graduate and undergraduate interests and talents, thereby gaining a tangible deliverable while giving students the opportunity to acquire practical knowledge in their specific fields of interest.

Education

Corporate sponsors receive complimentary seating for the Supply Chain Leaders Forums as well as priority registration and discounts for the open enrollment supply chain programs and certificates.

“There is tremendous value in working with CSCR. Leaders Forums are a nice mix of manufacturing, distribution, consultancies, business processes, and third-party providers. They address the effects of current events and emerging technologies on business efficiency, such as when RFID was going to revolutionize supply chain, or how companies can prepare to mitigate risk in the event of natural catastrophes like the tsunami in Japan and volcano in Iceland.”

Joe Gallick, Vice President-Dedicated Services, Outsourced Supply Chain Solutions, Dedicated Contract Carriage, Integrated Logistics, NationalLease, AmeriQuest Business Services
**Talent Recruitment**

Corporate sponsors receive complimentary registration and prime booth placement for the Supply Chain Career Fair, a two-day, twice-yearly event represented by 90-100 companies and attended by more than 400 graduate and undergraduate students in supply chain and industrial engineering.

The event targets students interested in full-time employment, co-ops, and internships in supply chain. Sponsors are also invited to attend the Corporate Sponsor Information sessions on the night before the Career Fair to talk with undergraduate and graduate students about career opportunities in their companies and the associated job application processes.

“At Penn State, there’s an understanding of the interplay of multiple constituencies, including faculty, business, students, and alumni. We nurture students through applied learning opportunities such as internships, co-ops, and independent-study research projects. Students go out to great positions and, in turn, they give back to the school they love, as teachers, donors, and more. This is the ‘talent cycle.’ The mission of a college of business should be to cultivate and groom the next generation of talented business managers. No one does this better than Smeal.”

*Susan Purdum, Instructor of Supply Chain and Information Systems*

**Management Support**

Corporate sponsors can meet in person with our faculty affiliates to brainstorm industry-specific issues. Sponsors also receive assistance with preliminary information collection for their supply chain initiatives.

**Exclusive Communications**

Another benefit of corporate sponsorship is ongoing access to an exclusive online knowledge exchange.

“We have great ties with alumni, who come back to the College and remain active. Our sponsors provide input to our executive education programs like the Supply Chain Leaders Forums. CSCR’s very popular Supply Chain Career Fair resulted from requests by our sponsors at the Corporate Sponsor Advisory Meetings, as well as a 2-hour ‘mini-event’ called Exploring Careers in Supply Chain, where sponsors come in and tell the stories of their career paths to Smeal freshmen and sophomores for early introduction into the supply chain field.”

*Tracie Shannon, Administrative Director, Center for Supply Chain Research*

**Benchmarking**

Member participants share best practices, incorporating quantitative and qualitative data, to help refine their companies’ processes and operations. Each consortium meets two times yearly and features session facilitators, keynote speakers, and breakout sessions.

“Benchmarking sessions are designed for small groups. There’s a lot of give-and-take, and attendees determine the trajectory of meetings. Participants learn from one another, troubleshoot, gain new ideas, and validate existing ideas. And the Center learns more about what companies are doing, such as management by exception or running the gamut of organizational planning. Sound organizational planning can result in huge savings, but not all companies do it or know how to do it well.”

Lauren Bechtel, Program Director, Center for Supply Chain Research

Members of the Distribution and Customer Service Benchmarking Consortium, together with faculty affiliates and industry consultants, participate in measuring, studying, analyzing, and comparing operational, tactical, and strategic processes for improving customer relationships and order management. Participants explore how to create value for their organization and trading partners through order-placement technology, perfect order measurement, and other means.

The Sales and Operations Benchmarking Consortium is a networking and knowledge-sharing venue in which industry practitioners and faculty specialists share best practices in demand and supply planning, forecasting, collaboration, processes, technology, and talent development. Members explore how intra- and inter-company collaboration can help to balance supply and demand within an organization, and how to view this process as a way to link strategic planning and operational planning with financial planning.

Executive Education

The Center for Supply Chain Research is active in developing and delivering executive education programs to practitioners in supply chain management.

Supply Chain Special-Focus Programs

CSCR sponsors two programs centered on maintaining robust supply chains in a global, digital economy: the Supply Chain Leaders Forum and the R. Hadly Waters Supply Chain Symposium.

The Supply Chain Leaders Forum is a two-day, twice yearly event open to corporate sponsors of the Center. It is geared to mid- to senior-level supply chain managers and executives, and its purpose is to foster peer discussions of current issues in supply chain management. CSCR Corporate Sponsors select the forum themes.

The R. Hadly Waters Supply Chain Symposium, named in memory of a long-time Penn State professor of transportation, gives supply chain practitioners and educators a venue for sharing their vision and experience on such topics as integrating supply chain processes and technology, agility in international logistics, defense market innovation, sustainability, and the future of supply chain management.

A Vital Partnership: CSCR and Penn State Executive Programs

The Center for Supply Chain Research partners with Penn State Executive Programs to design and deliver open-enrollment and custom-learning programs for supply chain executives.
“When Penn State Executive Programs and the Center for Supply Chain Research collaborate, we create and deliver the best possible learning experiences to supply chain executives. We have complementary skills that reflect Smeal’s standard of excellence. Executive Programs knows the learning market, from business development to contracting to learning design. And CSCR has great subject matter expertise, with access to faculty both within and beyond the department, who know the pulse of industry needs.”

Maria Taylor, Managing Director, Penn State Executive Programs

Open-Enrollment Programs

The first open-enrollment offerings in supply chain were in 1991, and 2000 saw the start of what would be the largest enrollment custom-learning initiative, the Marine Corps Logistics Education Program. More than 2,400 Marine Corps, Navy, and civilian logisticians are MCLEP alumni. To date, CSCR and Penn State Executive Programs have delivered more than 100 executive education programs in supply chain management in fourteen cities on five continents. Current open-enrollment programs include the following:

- Essentials of Supply Chain Management
- Processes and Tools for Supply Chain Success
- Achieving Supply Chain Transformation
- Developing Strategic Supply Chain Leaders
- Aligning Supply Chain Organizations
- Supply Chain Analytics
- Forecasting and Inventory Management
- Fulfillment Operations Management
- Transportation Operations and Sourcing

“As companies outsourced more, supply chain needed to be a strategic rather than functional focus. Supply chain strategically affects the operational performance of a firm, as well as customer satisfaction... Quality improvement efforts moved from the inspection function to a mindset across organizations. Companies removed waste and unnecessary costs. The next step was to look throughout the supply chain to drive value in the organization.”

Jeffrey L. Spearly, Senior Director, Learning and Development, Penn State Executive Programs

Supply Chain Certificate Programs

Business executives who complete a combination of the open-enrollment supply chain programs can receive a certificate in supply chain management, leadership, and operational excellence.
Department of Supply Chain and Information Systems

The Department of Supply Chain and Information Systems (SC&IS) is one of six academic departments in the Smeal College of Business, which also include Accounting, Finance, Management and Organization, Marketing, Risk Management (with Actuarial Science, Enterprise Risk Management, and Real Estate options).

“Our department stands apart from the competition because of our strong theoretical research base coupled with strong connections to industry, students, and alumni. Our executive education programs are a vital interface between academic programs and business, we have our own job placement center and Career Fair, and our faculty are invited to be affiliates of the Center for Supply Chain Research. The combined synergy has earned us top industry rankings from Gartner and top 3-5 rankings in ‘U.S. News and World Report.’”

Gene Tyworth, Chair, Department of Supply Chain and Information Systems

Faculty may hold joint or courtesy appointments in related academic units, including the Department of Statistics and the School of Information Sciences Technology. Industry practitioners, academic institutions, and the business media consistently rank the Department of Supply Chain and Information Systems as the top supply chain program in the country, both in industry value and program depth and scope. It is one of the largest and most respected academic concentrations of supply chain education and research in the world.

“I admire the Penn State approach to education, and have interviewed and hired many of their students as interns and after graduation... Penn State graduates worked with Nabisco to write specs for systems of order entry, built-in inventory, transportation, and order planning. This evolved to developing plans to support sales forecasting, and to distribution and materials requirements planning. Every step along the way, Penn State was one or two steps ahead of where everyone else was.”

Joe Andraski, Founder, Collaborative Energizer LLC, and former President and CEO, VICS

Undergraduate and Graduate Studies

The Department of Supply Chain and Information Systems (SC&IS) curriculum integrates strategic procurement and supply management, manufacturing and service operations, demand fulfillment, and processes involved in reverse logistics, recycling, and remanufacturing, together with information systems as the critical enabler of supply chain efficiencies and responsiveness.

SC&IS courses cover the chief activities involved in these processes, including information systems and management, purchasing; inventory flow scheduling and control, logistics-production coordination, transportation systems operation and infrastructure, customer service and order fulfillment, and distribution facilities management. SC&IS is committed to the continuous development of new teaching materials and methods.
“Penn State’s logistics department was the only one of its kind in the country for a long time. Logistics in other universities were subsumed in other departments. The success of the Department of Supply Chain and Information Systems has been helped tremendously by the entrepreneurial bent of department chairs and by the loyalty of students… Effective business education is a collaboration between educators and practitioners. We pride ourselves on the application of business education to industry. We get out and we see things.”

Robert Novack, Associate Professor, Supply Chain and Information Systems

Supply Chain Graduate Programs

The Smeal College of Business is widely regarded as a top-tier supply chain graduate program and is accredited by the Association to Advance Collegiate Schools of Business-International, the leading business school accrediting body. The Department of Supply Chain and Information Systems, in partnership with the Penn State World Campus, offers online graduate and certificate programs in supply chain studies.

Online Graduate Certificate in Supply Chain Management

The Graduate Certificate in Supply Chain Management is a one-year, 12-credit online certificate program of graduate courses designed to build competencies across the foundation of supply chain and information systems. The certificate can serve to fulfill the first-year requirement of the department’s online Master of Professional Studies in Supply Chain Management.

Master of Professional Studies in Supply Chain Management

The Master of Professional Studies in Supply Chain Management is a 30-credit, two-year online degree program grounded in proven theory, best business practices, and emerging innovation. It is a perfect fit for industry professionals and other students seeking to enhance and deepen their knowledge of supply chain processes, from managing information technology to crafting supply chain strategy.

“In 2003-2004, graduate certificate alumni began expressing interest in degree programs. By mid-decade, we had 300 to 400 alumni of the graduate certificate program. Now, about half the people who start out in the certificate program go on to get a master’s. People come to supply chain from different backgrounds. Because our courses are for professionals, we look chiefly at applications and best practices, with theory that has been proven in practice. The emphasis is on student interaction.”

Gary Gittings, Instructor of Supply Chain and Information Systems, Director, On-line Graduate Programs, Supply Chain & Information Systems, and Senior Research Associate, Thomas D. Larson Pennsylvania Transportation Institute, Penn State
**Smeal MBA Program**
The internationally ranked Penn State Smeal MBA Program prepares students with both functional expertise and broad business perspective to excel as a principled leader in a global business world. The curriculum is designed with the input of corporate recruiters and alumni advisers in top organizations. After focusing primarily on business fundamentals throughout the first year, the second year provides enhanced flexibility with concentration opportunities in finance, marketing, innovation and entrepreneurship, strategic leadership, supply chain management, and sustainability and social innovation.

**Smeal eMBA Program**
The Philadelphia-based Penn State Smeal Executive MBA Program ranks among the best in the world according to *The Wall Street Journal* and *Bloomberg Businessweek*. The 21-month program focuses on personalized leadership development, starting with business basics in year one and developing a combination of skills across the fundamentals of business in year two: financial risk management, IT strategy, investments, product pricing, supply chain strategy, organizational strategy and advanced team building.

**Smeal Ph.D. Program**
The Smeal Ph.D. Program is driven by academic excellence and defined by collaboration. We maintain a deliberately small Ph.D. community—ensuring close connections among doctoral candidates and their faculty mentors. Candidates can specialize in one of six primary fields: accounting, finance, management and organization, marketing, real estate, and supply chain and information systems.

Ph.D. students work closely with the Supply Chain and Information Systems faculty to identify areas of research interest. In the *Supply Chain* concentration they may choose to specialize in: supply chain coordination and contracting, closed-loop supply chains and reverse logistics, procurement management, procurement auctions and market design, inventory management, production and distribution management, supply chain network design, and supply chain analytics. In the *Information Systems* concentration they may choose to specialize in: modern information technologies, information systems analysis, or information systems design and implementation.

"Supply Chain at Penn State is a very collegial atmosphere. I give John Coyle a lot of credit. He has a great vision and a great way of dealing with people. He has always treated students well and tried to help them get jobs, which has benefited the Department and Center in the long run... The culture of the Department included a willingness to work hard when there wasn’t a lot of immediate payoff for individual faculty. We did a lot of research and published it, focusing on the practical world."

Alan Stenger, Professor Emeritus of Supply Chain Management, Supply Chain and Information Systems

**Research**
In promotion of industry best practices, the Department of Supply Chain and Information Systems actively engages in both theoretical and applied research. SC&IS research faculty and graduate students often collaborate with colleagues in other disciplines and in industry, including those affiliated with the College’s many research centers.
The research centers at Smeal offer a world-class resource for knowledge creation. They are a community of leading researchers from the College, the university, and other institutions, working together with senior executives from sponsor companies and government entities to help organizations achieve competitive advantages in efficiency, innovation, market presence, and ultimately, profitability.

**Recruiting**

The Department of Supply Chain and Information Systems has a permanent placement recruiting process that emphasizes personal attention to corporate recruiters, students, and SC&IS alumni, including a web-based career services management system that incorporates postings of company job openings and student résumés, transcripts, and related job-search documents.

The system was implemented for use by full-time SC&IS students, typically seniors looking for entry-level positions, and was expanded to allow alumni access after the 2009-2010 U.S. economic downturn. Access is also given to corporate sponsors of the Center for Supply Chain Research, and companies keep a close eye on the system for purposes of scheduling on-campus interviews with students. To ensure that the system continually meets user needs, SC&IS regularly reviews the Senior Survey required of all Smeal College of Business seniors as well as the post-Career Fair surveys completed by participating companies.

SC&IS also holds an interview/résumé workshop for upper-level undergraduate students every fall and spring, with companies volunteering to conduct mock interviews and follow-up critiques.

“Between our office, department faculty, and the Center for Supply Chain Research, we have frequent face-to-face interaction with our students. It’s very rewarding... Other universities typically have overall career placement centers. John Coyle was the prime mover behind doing something extra for the students.”

Tami Barnes, Recruitment and Admissions Coordinator, Supply Chain and Information Systems
Going Forward . . .

Emerging Issues in Supply Chain Management

"Environmental initiatives have impacted every aspect of supply chain, including the extractive industries—iron ore, coal, nonferrous metals, and tar sands oil. Some of the big issues are air and water quality, safety regulations, and security measures for companies doing international business—both at plants and in containers shipping goods. Today, when building fixed facilities, you have to ask yourself: "How energy-efficient are they?" and "How does the use of coal as fuel affect facility production?""

John Spychalski, Professor Emeritus of Supply Chain Management, Supply Chain and Information Systems

In the wake of mounting regulatory pressures for sustainable business practices, industry executives are becoming increasingly aware of the need to include “green supply chains” in their strategic thinking. As more consumers ask questions about how green a company’s supply chain processes are, from sourcing to manufacturing to delivery to recycling, the challenge for business executives is how to achieve financial gains while improving environmental performance. Companies are evaluating potential improvements to operations all along the supply chain, such as establishing reusable container programs with suppliers, and adopting practices that reduce waste-disposal costs. They are also identifying the “ready-made” savings, such as those associated with fewer environmental-permitting fees.

“The Internet effect” is another big contemporary issue in the field of supply chain, including e-tailing and direct home delivery, online discount couponing on inventory, customer facing (communicating with existing and potential customers through social media), and on-demand learning. Other issues relating to use of technology are enhanced tracking and monitoring through point-of-sale data, product delivery, and internet purchases.

This is where “big data” comes in. Quantities of good information can help with identifying purchasing trends, reducing inventory, and ensuring timely delivery of products and services—but only when acquired, managed, and interpreted with the aid of sophisticated information technology, expert IT support, and business analysts who can bridge the sometimes daunting gap between the helpdesk and the boardroom.

A prominent emergent issue in supply chain management is risk management as it relates to natural disasters around the globe, round-the-clock cyber security, business-to-business counterfeiting, and political factors including government stability in other nations. Also coming to the attention of business executives is the potential effects of 3-D production technology on operations and profits.

The demand for supply chain professionals has remained high even in recent times of high unemployment rates and slow economic recovery. In 2012, the U.S. Government announced a National Strategy for Global Supply Chain Security, and in the first quarter of that year, nearly 50,000 supply chain jobs were posted online by organizations in both the public and private sectors (though not all of the postings included the word supply chain). The challenges associated with these current and emerging issues are many. But so are the opportunities. There is still much to be done in the growing green arena, within the vast reaches of information technology, and in the expanding domain of risk management, and businesses are clamoring for supply-chain professionals to step in and innovate.