

SUMMER 2011

# Encore



THIS ISSUE

**Manufacturing  
in New England**  
Making It Here



Northeastern University  
College of Professional Studies

# MANUFACTURING IN NEW ENGLAND

## Making It Here



**While its influence is often overlooked today, manufacturing has been a vital segment of the New England economy for more than 220 years.**

It was in Rhode Island in 1790 that Englishman Samuel Slater founded the country's first cotton mill, establishing New England as the birthplace of American manufacturing. The textile industry in New England became the model for new forms of manufacturing. Its rivers provided the requisite water power and transportation to support the growth of manufacturing in the region.

Today, New England continues to be an influential region for manufacturing. Centuries of economic, social, and technological developments have forced the industry to adapt. The region's textile industry has been replaced. Old-world mills have been converted to modern manufacturing facilities for high-value products for the biomedical, high-tech, defense, and space industries.

The products manufactured in New England range from the everyday to the out-of-this-world—baseball gloves, golf balls, synthetic skin, biosurgery devices, infrared sensors, sniper detection systems, radar equipment, ceramic components, high-voltage cable assemblies, robotic welding systems, lighting fixtures, decorative glass, sailboats, snow shovels, textiles, food and beverage, and jewelry.

And contrary to general belief, not all manufacturing jobs have been shipped overseas. In fact, in Massachusetts, manufacturing is considered a growth industry. The state boasts over 8,000 manufacturing companies, which generate more than \$40 billion in revenue. Manufacturing remains the fourth-largest employer in Massachusetts, behind healthcare, retail, and education. The state estimates 100,000 or more jobs will need to be filled in this sector over the next 10 years. And over the next five years, 55 percent of manufacturers expect to

expand their operations in Massachusetts, and 60 percent of manufacturers expect to add jobs to their Massachusetts operations.

According to the most recently published information, Rhode Island's consumer product manufacturing sector employed more than 26,000 highly skilled workers in 2006. The state's jewelry manufacturing industry is home to more than 400 companies engaged in all parts of the jewelry supply chain.

In this issue of *Encore*, we pull back the cover on the manufacturing industry in New England as we take a look at the successful manufacturing operations of four College of Professional Studies alumni.

Representing the jewelry industry of Rhode Island is University College (UC) alumnus Jack Feibelman, founder and chief financial officer of A&H Mfg. Co. Feibelman, who invented a breakthrough in jewelry merchandising in the late 1960s, emphasizes the creativity required to be successful in manufacturing.

UC alumnus Peter Frasso, president of Segue Manufacturing Services, talks about the role of contract manufacturing services in today's manufacturing industry.

We'll also hear from two alumni who have found success in the manufacture of highly specialized products. Randy Cotter started a company that was one of only a handful of manufacturers creating the piping systems for biopharmaceutical plants. And Tom Foley heads up Dynavac, which manufactures high vacuum systems for space simulation and other custom-engineered applications.

These businesses are prime examples of the range of manufacturing operations that are thriving in New England's manufacturing sector today and having a measurable impact on the region's overall economy. □

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#### FOUR COLLEGE OF PROFESSIONAL STUDIES ALUMNI

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## LISTENING TO THE VOICE OF THE CUSTOMER

Segue Manufacturing Services President **Peter Frasso** shares his formula for success in manufacturing

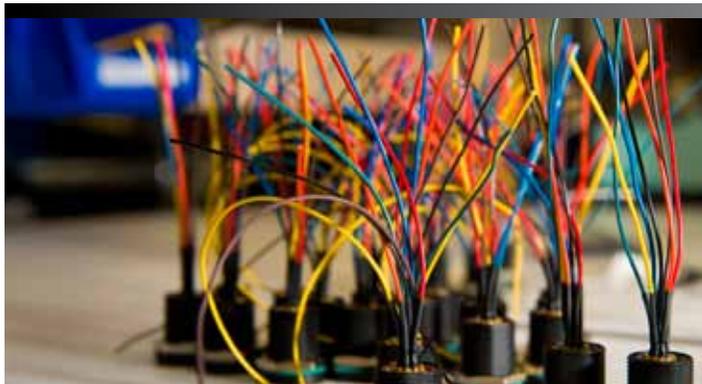
Peter Frasso (BS, Mechanical Engineering, Northeastern's Lincoln College '80) admits he wasn't among the top students in high school. At the time, he was more interested in "making things." In fact, as a teenager, he built one of his first cars, a Ford Falcon, from parts bought in a junkyard.

Frasso has continued to nurture his interest in making things throughout his career in manufacturing, and now serves as president of Lowell, Massachusetts-based Segue Manufacturing Services. Segue is a global contract manufacturer providing engineering services and manufacturing capabilities to a

range of industries, including alternative energy, military, semiconductor, medical/life sciences, homeland security, and industrial equipment.

### Engineering a Successful Career Path

After earning a two-year degree from Wentworth Institute, Frasso took a job at Pratt & Whitney Aircraft where he realized he wanted to become an engineer. He made a decision to quit his full-time job and continue his engineering studies part-time at Northeastern University's Lincoln College, while also supporting his family by working a temporary job at Magnetic



## Contract Manufacturing Defined

Contract manufacturing is the manufacture of a product or component by a third party. This form of outsourcing enables companies to reduce costs associated with manufacturing facilities and equipment, and gives access to high-quality manufacturing at a reasonable cost.

Corp. of America (MCA). Following graduation, he continued to advance his career at MCA, overseeing the construction of super-conducting wire and magnets used in magnetic resonance imaging.

In 1989, Frasso went to Varian, where he held a number of positions in engineering, production, and marketing during his 18-year tenure with the company. Eventually, he became vice president and general manager of the Vacuum Products Division and led the division to be twice named as one of *Industry Week's* "Best Plants in America," winner of the Massachusetts Quality Award, and a 1997 Malcolm Baldrige finalist in the Manufacturing category. "Baldrige consists of three core principles—find out what the customers' wants and needs are; organize the factory and organization to fulfill and meet those needs better than anyone else; and measure how well you're doing it," states Frasso. "These principles, and the hands-on experience I gained at Lincoln College, provided me a more intimate understanding of how to align an organization from engineering to the factory floor to the hands of the customer."

A technique Frasso frequently incorporated into his growth strategy at Varian was to survey customers at all stages of the buying cycle and during all customer interactions. "Listening to the voice of the customer is essential to continuous improvement, total customer satisfaction, and understanding future requirements to help drive a company's business strategy and

## COMPANY SNAPSHOT: Segue Manufacturing Services

### FOUNDED

1991 (CDM); acquired by Segue in 2007

### LEADERSHIP

Peter Frasso, *President & CEO*

### CAPABILITIES

- Turnkey manufacturing solutions (vertical integration: complex cables and harnesses, machining, global sourcing)
- Supply chain management and global sourcing (demand management, procurement and logistics, vendor-managed inventory, local integration and delivery)
- Engineering services (prototype design and 3D modeling, CAD/CAM design, manufacturing documentation, tool and fixture design, engineer and maintain mature products)

### MARKETS

Telecommunications, Homeland Security, Aerospace, Semiconductor, Industrial, Military, Medical

### HEADQUARTERS

Lowell, Massachusetts (44,000 square foot facility)

### EMPLOYEES

Over 540 worldwide, including 140 in the United States

### OTHER LOCATIONS

Xiamen, China (55,000 square foot facility)  
Partner operations in Argentina and India

<http://www.segue-mfg.com>

“These principles, and the hands-on experience I gained at Lincoln College, provided me a more intimate understanding of how to align an organization from engineering to the factory floor to the hands of the customer.” – Peter Frasso

## Performance Excellence Recognized

### THE BALDRIGE PERFORMANCE EXCELLENCE PROGRAM

The Baldrige Performance Excellence Program is the nation's public-private partnership dedicated to performance excellence. The program's mission is to improve the competitiveness and performance of U.S. organizations for the benefit of all U.S. residents. For more information, visit the National Institute of Standards and Technology (NIST) website: <http://www.nist.gov/baldrige/about>.

### THE MASS QUALITY AWARD

The Mass Quality Award (MQA) is awarded to the company that best exhibits and practices those characteristics that lead to a quality, customer-focused enterprise. This focus on quality, under the direction of the Massachusetts Council for Quality, is an ongoing effort to ensure the competitiveness of businesses in Massachusetts. A candidate for the MQA undergoes a rigorous site inspection and then is rated according to standards based on the criteria of the Malcolm Baldrige National Quality Award.

success,” he adds. “In addition, education and empowerment of employees and work teams directly results in a higher level of customer satisfaction.”

After Varian, Frasso's career progressed into the semiconductor industry for the next eight years. “While working in the semiconductor industry, I discovered a need for a certain type of contract manufacturer—one that was more sophisticated in the engineering, quality, and production environment than a mom-and-pop shop, but flexible enough to support a high-mix, low-to-moderate volume product environment. I saw this as a turning point in my career to start my own company,” continues Frasso. In 2007, he founded Segue Manufacturing Services and acquired the assets of Cable Designs and

Manufacturing (CDM), a cable and harness company, where he immediately began surveying its current and target customers, training and empowering his employees, and developing a lean manufacturing environment in order to address the niche he had identified. Under the Segue brand, the company established itself as a low-volume, high-mix contract manufacturer, providing end-to-end solutions for its customers.

Over the next three years, Segue quadrupled its business. The benefits of offshore parts sourcing and manufacturing spurred Segue to source materials in China for assembly in their Lowell facility. It was a natural progression to acquire a contract manufacturing partner overseas. In November 2010, Segue acquired Sanbor Interconnect in Xiamen, China. The 55,000 square foot manufacturing facility provides expanded capabilities and a low-cost regional presence for parts sourcing and engineering. “We can offer our customers the cost benefits of off-shore manufacturing with Segue's continued approach to local service, support, and focus on the customer,” explains Frasso. “In addition, China is a market in its own, and many of our capital equipment customers have located there. If we want to continue doing business with them, we need to be there.”

Frasso attributes much of his success to having a true passion for manufacturing. “Manufacturing can be a great career for those that have a passion for building things, working through problems systematically, and working in a team environment. It's not a world for those who want to sit in the corner—it's social and requires mutual respect and interaction at all levels,” concludes Frasso. “And above all, you need to stay focused on the customer and listen to what they have to say. It's a guaranteed step in the right direction.” □

*Frasso received a Bachelor of Science degree from Northeastern University's Lincoln College in 1980. He earned an associate's degree from Wentworth College in 1969. In addition to his role as president and CEO of Segue Manufacturing Services, Frasso serves on the board of directors for Lytron, Inc.; is a member of the senior advisory board for Massachusetts Excellence, a Baldrige-based nonprofit; and is an active member on the advisory board to Northeastern University's College of Professional Studies.*

## TALES FROM THE BIOTECH FRONTIER

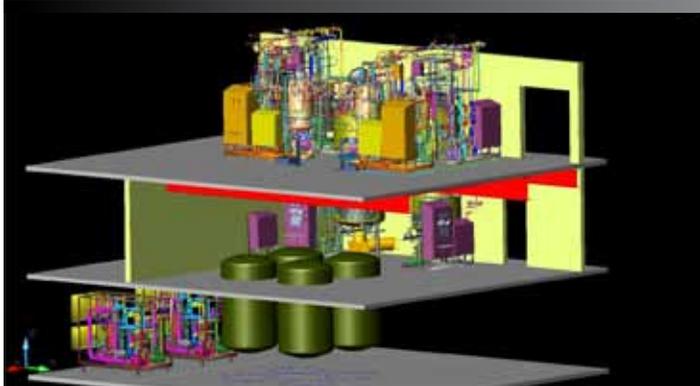
**Randy Cotter**, pioneer of piping systems for biotech, on creating standards in a nascent industry



No one can accuse Randy Cotter (AS, Mechanical Engineering, UC '69) of resting on his laurels. The semiretired founder of Cotter Corporation just landed a \$50,000 grant from the American Society of Mechanical Engineers (ASME) to continue his study of “dead leg” standards for process skid systems (piping systems) used in the biotech and pharmaceuticals industry.

You're probably wondering, what's a dead leg, and is it painful? It's an area in a piping system where liquid is not exchanged

during the flushing process. Bacteria can build up in a dead leg and recontaminate the piping system. Cotter analyzed the current engineering standards established to protect against this problem and found a flaw. Last year, he mocked up a piping system based on the standards and discovered it didn't work. “You can't get the air out,” he explains. “If you can't get the air out, you can't clean it.”

**MANUFACTURING PROFILE****COMPANY SNAPSHOT: Cotter Brothers****FOUNDED**

1979–2001 Cotter Corporation;  
2003 Cotter Brothers was founded

**LEADERSHIP**

Randy Cotter, Jr., *President*  
Tim Cotter, *Vice President*

**CAPABILITIES**

- Custom-fabricated process skid systems (piping systems for biotech manufacturing)

**MARKETS**

Biotech

**HEADQUARTERS**

Danvers, Massachusetts  
(8,000 square foot facility)

**EMPLOYEES**

60

[www.cotterbrothers.com](http://www.cotterbrothers.com)

As one of the pioneers in the development and installation of process piping systems for the biotech industry, Cotter practically wrote the book on standards at a time when none existed. So when he discovered the dead leg issue, he set to work on getting the standard changed. In March 2010, he documented his findings by videotaping his mocked-up system and posted the video on YouTube. Cotter then applied to ASME for the grant. He expects to complete the dead leg project by the end of the year.

Cotter has made a career out of creating opportunities like the dead leg project, which leverage his skills, curiosity, and unrelenting drive to solve problems. One of his first challenges was finding a way to earn a college degree. When he graduated from high school in 1962, a college education wasn't something he believed was within his reach. At that time, college was considered an elite opportunity. So he attended Wentworth Institute where he earned a certificate in mechanical design and discovered he had a knack for engineering.

Wentworth became his stepping stone to Northeastern's University College, where he earned an Associate's degree in mechanical engineering. "It took four or five years going to school nights," he recalls. "It was sort of the norm for everybody. At that time, 90 percent of people got married and had kids by the time they were 24, then bought a house and started struggling."

“You just do it. You have to have the ability to multitask, to not quit. In addition, Northeastern really taught me how to study. Before that, I struggled.” – **Randy Cotter**

University College brought a college education within reach by enabling Cotter to work full time in the Aircraft Engine Division of General Electric (GE) in Lynn, Massachusetts, while attending classes at night.

### **A Persistent Drive to Advance**

Cotter recalls the work environment of GE’s engineering design group as a big room filled with 100 people—10 rows of 10 seats. He recognized almost immediately that advancing in this environment would be slow and unsatisfying. “I sat in the back corner because I was the last one in,” he recalls. “When the guy in the front died or moved on, everybody moved up. I couldn’t get ahead because of the way the system was.”

In 1969 he moved on, moved up, and eventually moved into a successful career in sales. After 10 years on the road selling, he knew it was time to find his next challenge. He became the New York/New England sales representative for Dimetrics, a maker of automatic welding and thin wall, small diameter tubing, just as biotech was advancing beyond its infancy in Cambridge and Boston. Thin wall tubing and piping were critical for biopharmaceutical facilities. This was the perfect opportunity for Cotter to take the entrepreneurial leap.

With \$2,500 of seed money, he founded Cotter Corporation and spent weekends painting houses while trying to sell process piping systems to area biotech companies during the week.

In the late 1980s, he landed a \$1 million contract to install 5,000 feet of processed piping for Genetics Institute in Andover, Massachusetts. A year later, when the job was completed, Cotter had installed 123,000 linear feet of piping. His company grew rapidly from six to scores of employees, and he was working 10 hours a day, six days a week. “It’s a lot of risk, a lot of aggravation, and a lot of sacrifice,” he says. “I built up a premier process systems fabrications company and did business on a global basis. Eventually, I had 100 people working for me.”

Genetics Institute was only the third plant of its type in the world. Cotter went on to install the piping for the fourth (Amgen) and fifth (Biogen) facilities of this type. At the time, there were no engineering standards for these installations. So in 1989, Cotter and eight other leaders in the industry came together and created the ASME BioProcessing Equipment Standard (ASME BPE).

### **Welcome Back, Cotter**

By 2001, Cotter Corporation was on solid ground. It was one of only a half-dozen Process Skid Systems fabricators in the world serving the biggest names in the emerging biotech business, such as Pfizer, Johnson & Johnson, Genzyme, and Wyeth.

“Here I am going along, everything’s cool, when a guy from ITT comes to me and says I want to buy your business,” recalls Randy Cotter, founder of Cotter Corporation. He wasn’t looking to sell. But ITT said they would be opening an operation in Boston. After initially declining the offer, Cotter became concerned that a conglomerate the size of ITT could quickly put him out of business. So six months later, he called ITT to work out a deal. The deal was supposed to bring job security to Cotter, his three sons, and the company’s employees. But two years later, ITT and Cotter parted ways. His three sons decided to leave and start their own company, Cotter Brothers.

Three years later, ITT closed the business and laid off 600 people. Cotter Brothers moved back into the original Cotter Corporation building, remodeled the facility, and rehired 80 percent of the employees from the original company. “Customers came back and supported everything we were doing because they wanted a competitive industry,” says Cotter. “My sons have built it up a second time around, again making it a premier company.”

When asked how he was able to execute such sophisticated installations without the benefit of any standards, Cotter replies, “You just do it. You have to have the ability to multitask, to not quit. In addition, Northeastern really taught me how to study. Before that, I struggled. I was not an A student for sure. It disciplines you. You just don’t know it until 20 years afterward.” □

*In his semiretirement, Randy Cotter continues to consult in the industry. He chairs the ASME BPE steering committee and is a member of the main committee. Cotter is also an active member of the International Society of Pharmaceutical Engineers (ISPE).*

## MAKING THE MACHINES THAT SIMULATE DEEP SPACE

**Tom Foley**, CEO of Dynavac, on competing in a highly specialized, high-tech business



**COMPANY SNAPSHOT: Dynavac****FOUNDED** 1982**LEADERSHIP** Tom Foley, CEO**CAPABILITIES**

Dynavac produces engineered products that incorporate high vacuum technology. Products include:

- **Space Simulation:** simulates the temperature and pressure of space for environmental testing of spaceflight hardware. Systems range from tabletop units for component testing to the size of an aircraft hangar for full satellite tests.
- **Thin Film Deposition Equipment:** used to deposit a wide range of coatings onto surfaces and products. Applications include optical coatings, decorative finishes, wear-resistant coatings, solar panel production, and semiconductor processing.
- **Special Engineered Solutions:** supporting programs that include laser fusion, particle beams, and plasma fusion. Dynavac serves as an engineering and manufacturing resource to the scientific community.

**MARKETS**

Aerospace, Precision Optics, Solar Energy

**HEADQUARTERS**

Hingham, Massachusetts (40,000 square foot facility)

**EMPLOYEES**

72

[www.dynavac.com](http://www.dynavac.com)

Keeping it cool is a big part of Tom Foley's (BS, Industrial Technology, University College '87) business. He's the chief executive officer of Hingham, Massachusetts-based Dynavac, a manufacturer of high vacuum systems for thin film deposition, space simulation, and custom-engineered applications.

The company has developed an expertise working in a cold climate. Among the company's current projects is a cryogenic enclosure to support testing of the new James Webb Space Telescope (JWST). The JWST will be capable of viewing deep into the infrared spectrum, which requires it to be preflight tested to 30K (-405.4°F). Cooled by a helium refrigeration plant, the 45 foot diameter, 60 foot high aluminum structure will be installed in a large vacuum chamber at NASA's Johnson Space Center in Houston, Texas. The chamber was originally built for the Apollo program in the 1960s and is being upgraded to support the JWST program.

"It's exciting to be part of such an historic program, and we are very proud of our contribution," says Foley.

Another current project is a large coating system for Lilliputian Systems, Inc., of Wilmington, Massachusetts, the developer of the world's first Personal Power™ solution for consumer electronics. Dynavac's equipment will be used to support production of their emerging technology products, which are being targeted to the \$50 billion portable power market.

Simply put, Dynavac provides the process and test equipment that is necessary to manufacture complex products. As Foley explains, "We don't make the products; we make the machines that make the products."

Foley began his career as an apprentice machinist, working for High Vacuum Equipment Corp., where he became intrigued with the vacuum industry and its many applications. Foley

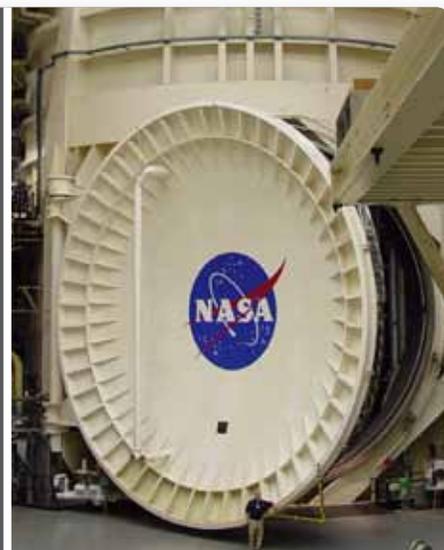
**A Closer Look at the James Webb Space Telescope**

*From the National Aeronautics and Space Administration's Official JWST Website*

The James Webb Space Telescope (sometimes called JWST) is a large, infrared-optimized space telescope, scheduled for launch in 2014. Webb will find the first galaxies that formed in the early universe, connecting the Big Bang to our own Milky Way Galaxy. Webb will peer through dusty clouds to see stars forming planetary systems, connecting the Milky Way to our own Solar System. Webb's instruments will be designed to work primarily in the infrared range of the electromagnetic spectrum, with some capability in the visible range.

JWST will have a large mirror, 6.5 meters (21.3 feet) in diameter and a sunshield the size of a tennis court. Both the mirror and sunshade won't fit onto the rocket fully open, so both will fold up and open once Webb is in outer space. Webb will reside in an orbit about 1.5 million km (1 million miles) from the Earth.

To learn more, visit <http://www.jwst.nasa.gov/>.



“Between a full-time job and evening classes, you had no other life. It gave new meaning to ‘total immersion.’ This may have fostered an intensity that became useful in dealing with challenging situations.” – Tom Foley



### The Benefits of Working with Northeastern Co-ops

Northeastern co-ops are well represented at Dynavac. For example, Northeastern student Andrew Hickson is presently employed as a co-op student at the company. What's more, Rob Pollara, Dynavac's mechanical engineering manager, worked at the company as a co-op student and was hired after graduation in 2000.

“We have had a co-op student on a pretty regular basis,” says Dynavac CEO Tom Foley. “They have all been very bright, motivated, and of good character. Typically, they have strong core skills in computer aided design (CAD) and that is where they start. Their engineering course background does a good job preparing them for more challenging work, such as structural analysis, thermal analysis, and vacuum system design.”

realized that if he wanted to advance his career in this field, acquiring the right education was imperative. He discovered University College would allow him to continue working full time while pursuing his degree, and began attending classes at Northeastern University's satellite campus in Weymouth.

“The program did a good job of providing core subject matter that was necessary to compete in a business environment,” says Foley. “One difference from a traditional day program was the fact that I was working full time while attending classes in the evening. This provided a tremendous opportunity to apply what I learned to an actual working environment. It was like a perpetual co-op program.”

Looking back, Foley admits that while the intensive daily routine of a UC student wasn't easy, it did help him develop skills that he would later apply throughout his career. “Between a full-time job and evening classes, you had no other life,” he explains. “It gave new meaning to ‘total immersion.’ This may have fostered an intensity that became useful in dealing with challenging situations.”

Among those challenging situations is running a successful business. Acknowledging regulatory and competitive challenges, Foley believes the United States is a very favorable environment for running a business. He stresses that in order to be successful, a company must be driven by customer satisfaction, committed to continual improvements in quality and efficiency, and maintain a capable and motivated workforce.

Foley acknowledges the complex impact of the global economy on all businesses including Dynavac's. He points to the pressure of foreign competition and the inevitable migration of production jobs as the United States emerges into a post-industrial society.

“On the other hand, the global economy presents new opportunities,” he explains. “Emerging markets become consumers. Knowledge and equipment are needed to operate their factories. I believe that there is also a benefit from the exchange of ideas. Many of our current management principles came from Japanese manufacturing philosophy. Continual improvement, lean manufacturing, and total quality management form the mantra of most modern management systems—all originated from Japanese industry.” □

## A GEM OF AN IDEA

A&H Mfg. Co. Founder **Jack Feibelman** on creative thinking, listening to the customer, and the future of U.S. manufacturing



*Encore* readers may recall Jack Feibelman from the Fall 2007 issue<sup>1</sup> of the magazine, which included a special feature highlighting a number of Northeastern University's wartime alumni. Feibelman, a World War II U.S. Army veteran, overcame a number of obstacles—from limited funds to being drafted to transportation challenges presented by the war—to earn his Bachelor of Science in Business Administration from Northeastern's University College in 1945.

Now in his nineties, Feibelman, the founder and chief financial officer of A&H Mfg. Co. of Johnston, Rhode Island, is an engaging businessman who maintains a regular work schedule. He can be found at the office most days until early afternoon, working closely with his son, Jeffrey Feibelman, who joined the firm in 1974 and has been the chief executive officer for more than 25 years. Jack has seen his share of changes in manufacturing over the years, from technological advances to overseas migration of jobs, giving him an insightful perspective on how to succeed in this industry.

Feibelman's career in manufacturing began in 1938 in the accounting department of Coro Jewelry, the largest costume jewelry company in the world at that time. He determined early on that a career in accounting was not going to fulfill him professionally.

Feibelman enrolled at Northeastern in 1939 to earn a business degree. Though his studies were disrupted in 1942 when he was drafted into the army, he continued his education after receiving a medical discharge and graduated in 1945.

"I was able to get a very well-rounded education," says Feibelman. "English Lit was part of it, and I think it's so essential. You need the humanities; you need a little legal background, accounting background, tax background—even though you're in manufacturing."

He continued to advance his career at Coro, where he quickly moved up the ranks—from bookkeeper to credit manager to assistant comptroller—in part, he humbly admits, because much of the workforce was away serving in the war.

**MANUFACTURING PROFILE**

When the war wound down, he saw his opportunity to move from accounting to manufacturing, and eventually became director of product development. Then, in 1967, with 30 years of manufacturing and business experience at Coro under his belt, Feibelman decided it was time to leverage his own innovative ideas and make the leap to entrepreneur. That's when he founded A&H Mfg. Co.

**Fabricating a Breakthrough in Jewelry Merchandising**

Before the late 1960s, costume jewelry was either laid out in a glass case under the department store counter or in baskets on top of the counter. This type of merchandising required a consumer to make an effort to look at the merchandise. Feibelman's goal was to tap into impulse buying behavior by making jewelry visible and accessible to women who may simply be passing through the jewelry department.

"I had the idea of taking a card and making a grillwork of wooden bars that allowed the card to hang at eye level so a woman walking through the store had to take in what she saw hanging there," he explains.

A&H's display cards were a breakthrough in the merchandising of costume jewelry, earning numerous U.S. patents. Feibelman acknowledges, "Many have expired. That's when you really have to prove your mettle. You've got to listen to customers well. And you've got to keep innovating, innovating, innovating."

A&H found innovative ways to extend the uses of its display cards, adapting them to bracelets, pins, necklaces, sunglasses, small leather goods, and more. The company went on to develop decorative gift boxes for jewelry, tags with barcodes, and display cards and labels with embedded security devices.

Feibelman emphasizes creativity has been the hallmark of A&H's long-term success. "Creativity will help you be ahead of the crowd," he says. "It might even keep your product here rather than going abroad."

But being creative alone is not enough to sustain a manufacturing business. Listening to customers is critical, he says, because "our customers give us great opportunities. They tell

**COMPANY SNAPSHOT: A&H Mfg. Co.****FOUNDED**

1967

**LEADERSHIP**Jeffrey Feibelman, *CEO*Jack Feibelman, *Founder and CFO***CAPABILITIES**

- Retail packaging products—display cards, paper and blister cards, puff pads, folding and set-up boxes, molded hangers, pressure-sensitive and embossed foil labels, hang tags, string tickets, custom electronic article surveillance solutions, and point-of-purchase displays
- Multicolor printing, coating, multitone extrusion, stringing, embossing, hot stamping, folding and gluing, laminating, vacuum forming, and hermetic and ultrasonic sealing

**MARKETS**

Specialty Packaging and Display Solutions for Apparel, Automotive, Cosmetics, Domestic Products, Eyewear, Footwear, Jewelry, Leather Goods, Sporting Goods, Tools, Watches, and Wine and Spirits

**HEADQUARTERS**

Johnston, Rhode Island (150,000 square foot facility)

**EMPLOYEES**

More than 1,000 worldwide, including 225 in the United States

**OTHER LOCATIONS**

Qingdao, China; Taiping, China; London, England

<http://www.aandhusa.com>

us their problems. If we can listen, even if we can't think of it right away, we take on the task of solving it for them."

One of A&H's recent patent-pending innovations came from a national retail chain seeking a theft prevention product. This retailer discovered that shoplifters were removing rings from cards and easily pilfering the rings from displays. A&H's challenge was to find a way to prevent the rings from being pulled from the display card. "We came up with an answer," says Feibelman. "We configured the die cut in the card so that we could add a molded component locking the ring to the card and yet allow the customer to test the fit of the ring."

The lesson for manufacturers, Feibelman adds, "You have to have fun solving the difficult. We don't always know where the answers come from, but we know that they're there." □

<sup>1</sup> Read the Fall 2007 issue of *Encore* online at <http://www.cps.neu.edu/alumni/encore-magazine.php>

# TIMELINE

## Providence's Heyday as the Jewelry Manufacturing Hub of the U.S.



### Late 1800s

A significant number of silversmiths set up shop on North Main Street in Providence to support a growing silversmith trade driven by the need of Rhode Island ship captains to fashion their accumulated wealth into plate for protection and storage. It is surmised that as the colony grew, and more wealthy captains moved into the city with their wives and daughters, there was a growing need for jewelry.

### 1810s–1830s

By 1810, an estimated 100 Providence jewelers generate \$100,000 from making inexpensive jewelry.

Following the War of 1812, the demand for affordable jewelry grows throughout the 1820s and 1830s.

### 1840s

Approximately 30 jewelry companies employ over 1,000 workers.

In 1844, Thomas Lowe brings the rolled gold-plate technique to Providence from England.

### 1850s

Electroplating is developed, providing a more consistent and easier application of gold plate.

With a variety of materials at their disposal, a large number of workshops and factories, and a population of skilled workers, Providence was uniquely situated to become the center for inexpensive jewelry production.

### 1890s

Nearly 160 jewelry companies are listed in Providence (and 90 companies in neighboring Attleboro, Massachusetts).

### 1930s

Mechanization and easily taught hand-work bring immigrant workers to the area, many of whom are women.

By 1930, half of all jewelry manufacturing employees are women.

### 1940s

Costume jewelry manufacturing dropped to a small percentage of the available capacity as the government restricted the use of metals and other materials needed for war production.

Younger men were drafted into the armed forces, so labor force availability was limited.

For the jewelry industry, 1946 was a banner year. Many new factories of all sizes were established in Rhode Island, and production quadrupled, making jewelry one of the most profitable categories for retailers.

In the following three decades, jewelry production employment grew to 60,000 workers, a major factor in Rhode Island's economy.

### 1950s

Costume jewelry manufacturing reaches its pinnacle in the U.S. in the early 1950s. In the world of jewelry manufacturing, Providence is likened to Detroit, home of the all-American automobile industry. Throughout the 1950s, costume jewelry remains a vital part of fashion.

By the late 1950s and 1960s, American marketing firms accelerated their imports from Europe and the Far East. The tremendous savings in costs of imported jewelry products gradually led to importing a growing percentage of jewelry sold in the United States. During this time, a small percentage of jewelry is made in America; Rhode Island's jewelry production is almost nonexistent.

### 1960s

Jack Feibelman designs and manufactures the first hanging display card for earrings, revolutionizing the jewelry industry. In 1967, Feibelman founds A&H Mfg. Co. in Providence, Rhode Island, to serve the display and merchandising needs of the region's jewelry manufacturers and marketers.

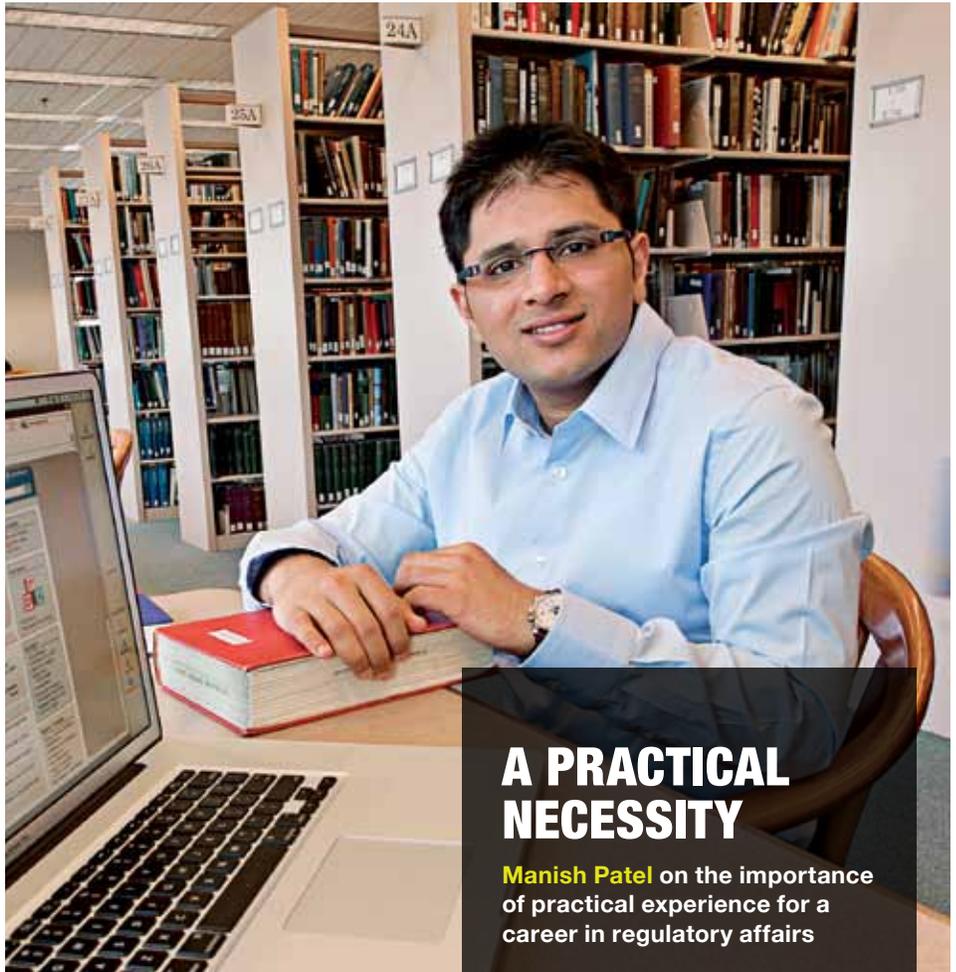
### 1970s through today

The migration of manufacturing operations to Asia and other areas around the world diminishes Providence's position as a jewelry manufacturing hub. However, there remains a core group of companies in the Providence area that continues to produce jewelry and components.

## MANUFACTURING PROFILE

In 2009, Manish Patel (MS, Regulatory Affairs, College of Professional Studies '11) was studying for a degree in pharmacy and interning at a pharmaceutical company in his native India. Less than two years later, he has been offered a position as a regulatory affairs professional at the Michigan-based Cranio-maxillofacial Division of Stryker, one of the world's leading medical technology companies, and a Fortune 100 company. This past spring, Patel graduated from Northeastern's College of Professional Studies with a Master of Science in Regulatory Affairs for Drugs, Biologics, and Medical Devices.

*Encore* had the opportunity to speak with Patel about the field and how the College's Master's degree has prepared him for a career in regulatory affairs.



## A PRACTICAL NECESSITY

**Manish Patel** on the importance of practical experience for a career in regulatory affairs

**ENCORE:** How did you hear about the College of Professional Studies' Master's degree in Regulatory Affairs for Drugs, Biologics, and Medical Devices?

**PATEL:** I was working in an internship rotation for Sun Pharmaceuticals, one of the leading pharmaceutical companies in India, as a part of my undergraduate curriculum. My experience moved me to find a regulatory affairs program to advance my career. A friend studied pharmacy at Northeastern, which spurred me to consider Northeastern's regulatory affairs degree. I was impressed by the course curriculum. I feel it's one of the best in the country. The program gives us a chance to practice in the real world—an important part of any regulatory affairs program.

**ENCORE:** Can you describe some highlights of your experience in the program?

**PATEL:** The MS program has an extensive curriculum providing knowledge on regulations in U.S. and global regulatory bodies with an understanding of the intricacies of clinical trials, intellectual property, and regulatory compliance. Further, it's a flexible program that allows one to select electives. You can choose the area where you want to gain expertise. For me, it has laid a strong foundation for regulatory affairs.

**ENCORE:** What was your co-op experience?

**PATEL:** I did my co-op at St. Jude Medical, a medical device company in Minnesota. It has been an invaluable learning experience. The co-op gave me the opportunity to apply all my theoretical knowledge into practical use and understand the various facets of regulatory affairs.

**ENCORE:** How do you plan to use your degree in regulatory affairs?

**PATEL:** I have accepted a full-time position with Stryker, in Kalamazoo, Michigan, where I'll be an RA/QA (regulatory affairs/quality assurance) representative. I plan to use this degree to advance my career in the field of regulatory affairs and contribute toward successful outcomes for the healthcare field.

**ENCORE:** What impact has the professional experience of your professors and your classmates had on your education?

**PATEL:** Regulatory affairs is largely about practical learning. It is not something that can be completely learned in school or by reading the FDA website. The professional experience of our professors and our classmates helped us generate a healthy discussion. This sharpened our critical analysis abilities and helped us think from a broader perspective so that we can successfully tackle issues in our work environment. □

## KNOWLEDGE AND KNOW-HOW

The technical knowledge and skills that are critical to succeeding in manufacturing are deeply rooted not only in the academic offerings at the College of Professional Studies (CPS), but also in the programs and departments that preceded CPS in educating generations of leaders.

**University College** Established in the fall of 1960, University College began as a part-time undergraduate division of Northeastern University. In its first year, 4,000 students enrolled. With an open admissions policy, University College's threefold mandate was to educate adult students with previous work experience, part-time students working toward an undergraduate degree, and full-time students who had varied scheduling requirements.



**Lowell Institute School** The Lowell Institute School was founded in 1903 at the Massachusetts Institute of Technology. Originally named the School for Industrial Foremen, it provided continuing education to industrial workers seeking to enhance their professional skills.

In 1903, the School began to expand its curriculum, offering two-year programs in mechanical and electrical engineering. During the 1960s, courses also were offered in structural and civil engineering, computer technology, high-speed strobe photography, machine tool fundamentals, scientific glass blowing, house building, technical writing, and microprocessor systems.



**Engineering Technology** In the fall of 1996, the Lowell Institute School was transferred to Northeastern University and became a division of the School of Engineering Technology, which also encompassed the evening engineering programs of Northeastern's Lincoln College. In 2006, the School of Engineering Technology and its programs grounded in the Lowell Institute and Lincoln College became part of the School of Professional and Continuing Studies, a predecessor to CPS.



Today, with the support of the Lowell Institute, our Engineering Technology programs prepare CPS students for dynamic careers as scientists, engineers, and technologists. Taught by accomplished industry practitioners, every full-time and part-time program leads to a bachelor degree, an associate degree, or a certificate in the growing field of engineering technology.