

Success Story: IMC Helps Lewis Lumber Products Reshape its Business through Innovation Engineering

written by Lauri Moon | May 1, 2014

Located in North-Central Pennsylvania, Lewis Lumber Products, Inc. is a quality manufacturer of fine hardwood mouldings, paneling, flooring, component parts and lumber. Selling to both wholesale and retail markets, Lewis Lumber takes great pride in the preservation and enrichment of the timberland environment and their own timberlands are part of the Chain of Custody Certification process for lumber from Pennsylvania State Forest Lands.

SITUATION

“We needed to get out of the foxhole and make a charge of some kind or else bury our heads and die.”

That’s how Lewis Lumber President Keith Atherholt characterized the circumstances when he first connected with IMC. “We recognized that demand in our business would not recover to the degrees of the past.” That fact is what prompted him to meet with IMC. “Discussing things really helped me to understand our situation even more thoroughly,” Atherholt shared, “and it was helpful knowing that we were not the only business or industry with these kinds of challenges.”

SOLUTION

It became clear that Lewis Lumber needed to more effectively generate meaningfully unique or differentiated products and services. Through conversations with IMC, company leadership believed that by more fully leveraging resources through a systematic innovation approach, they would be able to generate and develop new product and service ideas, as well as identify and develop customers and markets—all leading to increased sales, profitability and growth.

IMC recommended that Lewis Lumber embark on what would be a business-altering journey for the company. They proceeded with two projects: Innovation Engineering (IE) Jump Start and Innovation System Engineering System Development. These highly entrepreneurial experiences were aimed at helping Lewis Lumber to identify at least two product or service ideas and to create the company's own innovation system. The goal was to equip the Lewis Lumber team with significant knowledge of the innovation process and tools, increase their capability to innovate and set them on a path towards developing their own defined and re-finable Innovation Engineering Management System (IEMS).

The work included:

1. Planning — Gain a solid understanding of the inner workings of the company, ensure a collective understanding of the purpose and fundamentals of IEMS, establish clear objectives for next steps, discuss the IE Assessment Tool and identify Stimulus Mining opportunities for the initial Create Session.
2. Create — Apply Innovation Acceleration principles and transform Stimulus Mining insights to create and/or sharpen ideas.
3. Communicate — Using IE Communication tools, apply 3 P (Problem, Promise, Proof) structure to move ideas from more generalized to more focused and to begin validating the potential of the ideas for market success.
4. Commercialize — Apply IE tools to further understand the potential of the ideas by doing fast evaluations of market segments, potential customers, financial potential and various challenges and potential threats including design, manufacturability and cost.
5. Lewis Lumber System Build — Loosely construct a draft model of the Lewis Lumber Innovation System by completing a blank Innovation Funnel.
6. Idea Selection — Decide upon two or three ideas to move into a Discovery Phase and identify Project Leaders and a Management Coach for the projects.
7. Coaching Rapid Plan, Do, Check, Act (PDCA) Cycles — Apply Fail-Fast, Fail-Cheap methodology to swiftly and cheaply learn enough about the idea to either kill it or move it to the Development Phase.
8. Lewis Lumber System Build - Develop a draft of a Lewis Lumber Innovation

System.

9. Work, Refinement, Assimilation into Company Culture — Work on current projects while also placing emphasis on the further development of a defined Lewis Lumber Innovation System that can be sustained, taught to all employees and new hires and continually improved and refined with the intent to make Lewis Lumber a highly innovative enterprise.

RESULTS

Atherholt said that he was extremely pleased with the outcomes.

“In fact, we are confident that we can draw direct relationships to improved gross profit margins in product lines identified and altered in the innovation engineering process. Better yet, we developed a new system to process ideas. We’ve named it ‘LEMIS,’ for ‘Lewis Efficiently Managing Ideas Systematically!’”

The approach officially kicked off in 2014 and involved every employee, reinforcing the concept of ideas emanating from the floor-up rather than from management-down. Atherholt admitted, “This is a culture change. We have a small company and even in that small arena, this is taking time. We started in December 2013 with an employee meeting to introduce this concept. It took until March 2014 to put the next step in place of creating an ‘idea session’ with the entire company all at one time.”

“This is taking much longer than I would like, but we have woven in LEAN Continuous Improvements as well. I am confident that we will move forward with forming project groups, and I am sure that we will still depend upon IMC to guide us through building our own LEMIS. The future looks bright and positive! I am confident of profit-generating results!”

Through prompting of IMC, Lewis Lumber embarked on other positive steps too. These included sending the company’s general manager to a LEAN manufacturing class, Atherholt’s participation on an idea-sharing “Manufacturers’ Executive Forum” and an educational outreach program in which Atherholt and a panel of manufacturers spoke to 50 guidance counselors from local school districts about encouraging students to consider manufacturing as a career.

Success Story: IMC Helps REICHdrill Make Dramatic Turnaround

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REICHdrill® manufactures a complete line of rotary and DTH drilling equipment for use in the water well, oil and gas exploration, quarrying, construction and mining industries and is based in Philipsburg, PA.

Specifically, REICHdrill's production includes a series of truck-mounted drilling platforms, a full line of tractor-mounted drilling platforms, a full line of tractor and self-propelled based drilling equipment and support vehicles for those products.

The company was founded in the late 1940s by Wendell Reich and has roots leading back to the development of the first hydraulic top-drive rotary drill. The company has been producing drilling equipment at its current location since 1984, when REICHdrill acquired the CP line of rotary drills. REICHdrill has built a solid reputation in the industry for manufacturing the highest quality, best performing drills in the marketplace. The company continually drives innovation in the design process leading to the development of technologically advanced drilling equipment.

SITUATION

REICHdrill was in negotiations with the world's second largest mining equipment supplier on an agreement that would mean a significant ramp-up in production and export market delivery by an anticipated \$5 million per year over four years. Unfortunately, the company wasn't poised to take advantage of the opportunity due to operational and financial issues. The business had a critical need to refinance and restructure operationally, and was constrained by their physical space inhibiting further growth. The Strategic Early Warning Network (SEWN) came to their aid and engaged the company on multiple platforms including cash flow and planning, operations, thru-put and turns, production planning, and organizational planning for growth. IMC was brought into the mix to help attack issues on the operational front.

SOLUTION

The objective of IMC's work with REICHdrill was to help the company learn and apply a variety of lean tools and methods to better understand and analyze major product lines, improve set-up and product change times, identify and remove production bottlenecks, improve process flow, engage employees in continuous improvement activities, and in general move towards becoming a more lean enterprise. To that end, the project focused on two major areas —training on the principles of LEAN manufacturing and Value Stream Mapping.

To facilitate this effort, IMC brought in a highly experience Lean / Continuous Improvement solution provider from a sister center in York, PA. Participants were involved in open discussion and learned about the eight wastes that an organization must reduce in order to be competitive in today's marketplace. Topics included Standardized Work, Workplace Organization, Batch Size Reduction, Point-of-Use Storage, Quality at the Source, Raw Material Inventory, W-I-P Inventory, Finished Goods Inventory, and Pull Systems.

In terms of the other major component of the project with IMC, the intensive work on Value Stream Mapping provided REICHdrill with clarity on their Current State—from receiving customer orders and scheduling through all manufacturing operations, inspection, and shipping. A Future State value stream map was also

built, and both exercises equipped the company with the insights to identify and prioritize opportunities for improvement. Following that initiative, IMC continued to meet with REICHdrill to discuss improvement strategies and implementations.

RESULTS

Due to the work of IMC, MANTEC, SEWN, and of course, REICHdrill, 65 jobs were saved and the company is now experiencing significant growth and will be expanding their business. In particular, the work with IMC has resulted in the removal of constraints that prevented the company from working on multiple drill units at the same time, as well as the elimination of a severe bottleneck in the paint process. REICHdrill is now able to work on five units at a time, has changed the way that painting is done, and has implemented several other improvements. This positive movement has garnered significant positive results.

Success Story: IMC Helps Ascent Bio-Nano Technologies Advance Biotech Startup

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Ascent Bio-Nano Technologies is a biotech startup company that develops high-performance, low-cost miniature flow

cytometry devices for various industries based in State College, PA.

The company's mission is to develop innovative biomedical instruments to accelerate the impact academic research makes on society. The company's products are used in biomedical studies, medical diagnosis and therapeutics. The applications are expansive, including for HIV, leukemia and cancer diagnosis and the product is based on patented, renowned technologies.

SITUATION

Ascent's team had developed low-cost flow cytometer cell sorters that analyze and sort without damaging cells. The achievement was significant, earning them a financial investment from the Ben Franklin Partners of Central and Northern Pennsylvania. However, while the instruments were leading edge, they were developed for the lab setting. Moving the products to market would mean engineering them for production at a variable price point while maintaining stringent quality measures.

SOLUTION

IMC business advisor, Ed Zubavich, connected Ascent President and CEO Lin Wang with the Learning Factory, a program within Penn State's College of Engineering. The Learning Factory helps to provide engineering students with practical hands-on experience through industry-sponsored and client-based capstone projects. Wang submitted a project proposal to have students perform configuration designs to reduce the instrument footprint and provide a proof-of-concept prototype based on the lab-performing system of Ascent's cytometry instruments. The project involved solid modeling, basic electronics and interfacing and multi-disciplinary expertise. Student work included the following:

- Review the lab-performing system and understand the requirements of the proof-of-concept prototype.
- Identify the most suitable commercially available components to replace the

expensive lab equipment.

- Develop several concepts of prototype system design. Consider size, functionality, cost and system stability. Select one approach and develop it in detail.
- Assemble the prototype based on the design concept.

Students completed that work over the course of four months in the fall of 2012. Wang noted that her team was very pleased with the results. “The students brought good passion to the work,” she explained. “They were big contributors to choosing components, resolving modeling concerns and more.”

The effort was so successful that in January 2013 Ascent moved forward with a second project with IMC and The Learning Factory - this time, to *advance* the prototype developed in the fall. Students were charged with researching existing compact flow cytometry cell analyzers to develop an understanding of price, size, features and specification. Armed with that information, students moved ahead with a second prototype to consolidate power supplies, gain new efficiencies in the electronic design, optimize the data interface and enable system data to feed directly into commercially available software for display and analysis. The prototype was assembled, tested and the results compared to what was available in the industry.

RESULTS

According to Wang, these projects have helped Ascent in many ways. Having a solid prototype in place, Ascent has extended its position from solely a research lab to that of a serious business, placing it in good position for building even more credibility in the industry and with potential investors. The process also enables Ascent’s leadership to better plan for growth by allowing them to see what skills would be needed if they expanded their operation to in-house prototype development. Combined, the two projects have staged Ascent for future success.

Success Story: IMC Connects Lumax with The Learning Factory to Develop New Product

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Lumax Industries is a leading manufacturer of high quality, custom industrial, commercial, and institutional fluorescent and LED lighting fixtures. Founded in 1976, Lumax is privately owned and operated with a 150,000 square foot manufacturing facility based in Altoona, PA.

The company is a Made in the USA manufacturer, offering a complete line of fluorescent and LED fixtures for many lighting applications, including recessed parabolic and lensed troffers, recessed indirect, surface mounts, strips, channels, and industrial units, wraparounds, task and wall brackets, and vandal and security lighting.

SITUATION

Lumax's success can be attributed to a mastery of all the latest manufacturing and product technologies across the entire lighting spectrum; a well-established reputation for capstone quality and superlative customer service; and a willingness to design, develop, and manufacture lighting fixtures for an ever evolving and more specialized, technologically advanced marketplace.

Despite the company's rich history and ongoing success, Lumax's leadership

team also recognizes the importance of responding soundly to significant movements within their industry. With the growing momentum of LED technology, Lumax sought to explore the potential of an innovative LED industrial high bay light fixture.

SOLUTION

IMC Business Advisor Ed Zubavich connected Lumax Engineering Manager Rich Taylor with The Learning Factory, a program within Penn State's College of Engineering. The Learning Factory helps to provide engineering students with practical hands-on experience through industry sponsored and client-based capstone projects.

Taylor submitted a project proposal to have students design and fabricate two high bay LED lighting fixtures with stringent criterion for ambient operating temperatures, lumen output and distribution, ease of manufacture, and aesthetics.

"I can't say enough positive things about The Learning Factory, and I am thankful for the connection that IMC so proactively made. I truly felt like the students were a part of our team." - Rich Taylor

"I wanted to choose a project that would be brand new for us and not just a modification to an existing product," Taylor explained. "I wanted to start with a clean slate that would allow the students - who were senior-level engineers in an outstanding program - to be as creative as they want to be. I wanted to provide them that opportunity while also giving Lumax a chance to explore something beyond what we would normally pursue."

When Damian Rose, a project advisor with The Learning Factory and part-time instructor for the Department of Mechanical and Nuclear Engineering at Penn State, saw the Lumax proposal, he knew that the project would be a worthwhile endeavor for students. Rose, who is also an engineer at the Applied Research Laboratory (ARL) at Penn State, was exposed to Lumax products in ARL facilities.

"I was quite impressed with their product and knew that the company was one that believed in quality and innovation," Rose explained. "I felt that the project would

give students the chance to work with a solid, innovative company on a project that combined many different aspects of engineering —thermal analysis, electrical work, CAD work, fabrication, and more.” A team of five students worked on the project, with Rose serving as behind-the-scenes advisor and Taylor as the industry sponsor. IMC contributed funds to help formally launch the project.

Over 15 weeks, the students met with Lumax, presented multiple designs, regularly communicated with Taylor and abided timelines, and engineered a design that was aesthetically pleasing, worked thermally, and performed optically. They fabricated two fully functional prototypes that tested better thermally than LED high bay fixtures that were already on the market.

RESULTS

The students’ hard work paid off in a big way. A panel of industry experts judged the project a second place award winner at the 2013 Student Design Project Showcase held on the Penn State campus. The “LED High Bay Light Fixture sponsored by Lumax Lighting” was among some 163 projects at the event, including 115 senior capstone projects involving 560 seniors.

Lumax has since put the product on display in their Altoona showroom and clients and sales representatives have responded with enthusiastic feedback. The product was also a highlight of the Lumax booth at LIGHTFAIR International 2013, touted as the world’s largest annual architectural and commercial lighting trade show and conference.

Success Story: IMC Helps Videon

Central, Inc., Use QRM to Boost Quality and Inspire Innovation

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