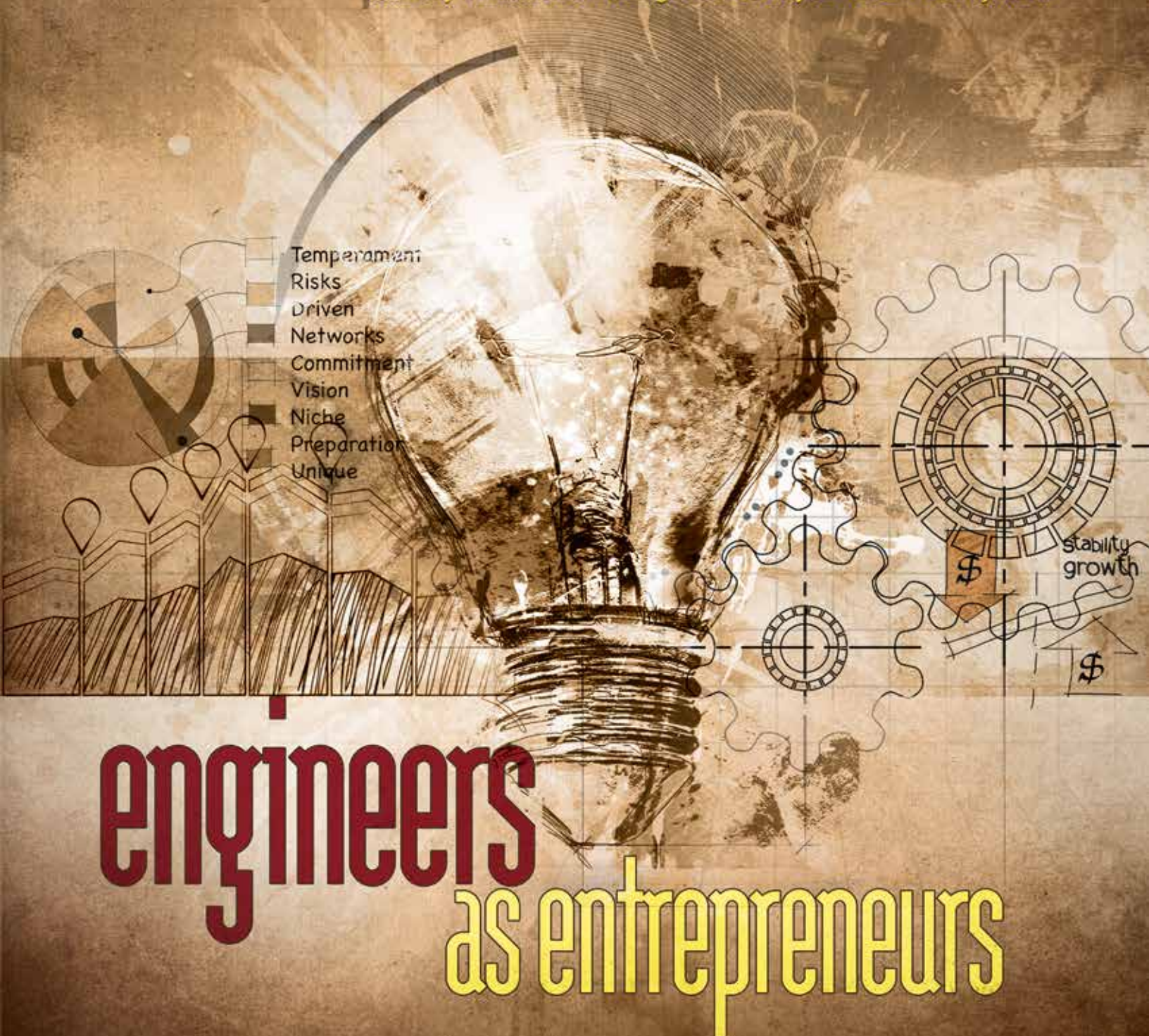


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Spring 2014

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Pittsburgh ENGINEER

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Pittsburgh Engineers' Building
337 Fourth Avenue
Pittsburgh, PA 15222

P:412-261-0710•F:412-261-1606•E:eswp@eswp.com•W:eswp.com

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Guest Editor Column

By Ann Dugan



Ann Dugan

Engineers as Entrepreneurs

Thanks in large part to entrepreneurship, the American dream is alive, well and stronger than ever. While entrepreneurs come from all backgrounds and academic disciplines, more engineers are looking to successfully commercialize products or systems they have developed.

Some of the world's most successful entrepreneurs are engineers, including David Packard, co-founder of Hewlett-Packard; Jeff Bezos, founder of Amazon; James Dyson, founder of Dyson Vacuums; Larry Page, co-founder of Google; and Jerry Yang, co-founder of Yahoo! In addition, more engineering schools across the country, including the University of Pittsburgh and Carnegie Mellon University, offer innovation and entrepreneurship courses and programs for students.

While it's one thing to prepare future engineers to become entrepreneurs, what about those of you already in the field? Would you like to go into business for yourself to sell a product or system you have developed? How do you know if it is the right move for you?

You can begin by examining your own nature to determine if you have the temperament to become an entrepreneur. While some characteristics recognized as being good in engineers match those found in successful entrepreneurs, a few are not and will have to be addressed before you take the plunge starting your own business.

Engineers are sticklers for detail, a good trait to have if you are starting a business. After all, from the beginning you will be responsible for virtually every detail connected with the enterprise including such non-engineering tasks as finding an accountant and attorney, arranging for financing, renting space for the business, hiring employees, monitoring expenses and purchasing office supplies. This is part of becoming an entrepreneur so prepare to learn about and become comfortable with the management side of your business. Remember that developing the product or system is only the start...you must tend to the management side as well as long as you are in business.

Engineers are often characterized as preferring predictability and to be in control of their situation...this contrasts with entrepreneurs who are willing to take chances, gamble on ideas and start all over again if necessary.

Many entrepreneurs, not just engineers, think it is a short step from conceiving and perfecting their product or service to establishing a business to marketing and selling it. Generally this is not the case. Even with the most careful planning, business involves risks, often unanticipated, and includes variables that you cannot control. This can be particularly frustrating for engineers who are used to working in a more structured environment with few or no surprises.

Engineers are often characterized as preferring predictability and

to be in control of their situation, an important component when conducting research or working on a project. This contrasts with entrepreneurs who are generally just the opposite—willing to take chances, gamble on ideas and start all over again if necessary. Engineers who want to become successful entrepreneurs must become more open to and comfortable with risk.

Another important step is to evaluate the commercial viability of your product or service since the concept of “make it and they shall buy” is not guaranteed, no matter how revolutionary your idea is. This involves getting out of your comfort zone to talk with other entrepreneurs and do market research to consider how the viability of your product idea and if a market exists for it.

As entrepreneurs know, few, if any, products sell themselves. This means if you are going into business marketing becomes fact of life. This can be a big change to engineers who are used to working alone or in groups that maintained control over what they are working on. You will have to sell your idea or product, first to banks or potential investors, then, once available or in production, to a wider audience. You must accomplish this in order to become a successful entrepreneur.

Being an entrepreneur also generally involves, at some stage, becoming a boss, which might be a new experience for you. You will now be hiring, negotiating salaries and worrying about providing health insurance and other benefits to your employees. If your business grows, some of these responsibilities might be shifted to other employees, but as the company owner and boss you will ultimately make the final decisions. The boss hat is an important one that you will have to adjust to wearing.

While some engineers will go out on their own or join with colleagues to establish a new enterprise, others will start a business involving family or evolving in that direction. Family businesses started with an entrepreneur who became successful enough that the business can be solidly transitioned to a new generation of the family. Today, some members of the next generation don't want to join the original family business but instead will strike out individually or partner with colleagues to establish a new venture. The new venture can be related to the core business such as in construction or engineering and leverages the capital or credit of the family in new and unique ways. This business model requires additional knowledge and consideration in order to handle such issues as the role of family members in the company, governance and succession planning.

As both an entrepreneur and a fourth generation member of a family-owned business, much of my career has involved working with the unique challenges faced by family-owned businesses. It is an area many entrepreneurs, no matter their background or business, will have to address as no one lives forever so planning early who will lead the important business they founded needs time and good planning – over and above estate/tax planning to get it right. The Institute for Entrepreneurial Excellence, since its founding in 1993,

has provided specialized resources to assist family-owned businesses in holistic planning not just tax planning

According to a survey by Duke and Harvard Universities, only 37% of 500 technology companies are headed by engineers or individuals with an information technology background. While this would indicate reluctance for engineers to become entrepreneurs Kirshna Uppuluri, author of Engineer to Entrepreneur: The First Flight, believes that now is a good time for engineers to become entrepreneurs because they can satisfy new demands and solve more problems.

David Karp, founder of Tumblr observed that an “Entrepreneur is someone who has a vision for something and a want to create.” While this is certainly true, becoming an entrepreneur, especially a successful one, is a journey of many steps. It is also the adventure of a lifetime and one that I urge you to consider taking.

About the Guest Editor..

Ann Dugan founder of the Institute for Entrepreneurial Excellence at the University of Pittsburgh which was created to foster the growth and development of family businesses and entrepreneurial firms. Over the last 20 years the Institute has assisted in the start-up of 800 new businesses, attracted \$300 million in funding to help consulting client businesses grow, and developed and delivered over 1,400 management educational programs attended by 40,000 plus regional business owners and entrepreneurs. Dugan's efforts have been recognized with numerous awards, including: Ernst & Young Central Mid West Entrepreneur of the Year 2009.

Ann has obtained a BS in economics and an MBA in Finance from the University of Pittsburgh.

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Pittsburgh ENGINEER caught up with current ESWP President Charles R. Toran, Jr., who is an entrepreneur in his own right. Mr. Toran is the founder and President of Sci-Tek Consultants, Inc., a civil, environmental and geotechnical engineering firm.

**Pittsburgh Engineer:
How and why did you
start the company?**

Charles Toran: I started the firm in 1996 through a combination of capital investments and bank loans. I spent the first 14 years of my professional career working for private industry, first for a large conglomerate, and then a smaller firm. Both of those firms experienced major financial challenges. When I left the large firm, during a period they were experiencing significant losses from a credit crisis, I went to work for the smaller company, who immediately started having financial difficulties due to some accounting problems. I think that my experiences at both of these firms, where I got to watch them nearly collapse, caused me to consider a whole range of options, including starting my own business. Once the idea of starting my business took hold, it became the most desirable option.

PE: What is the company strategy for growth?

CT: We focus on evaluating our environment for the best opportunities, understanding our customer's needs, and providing good service.

PE: What are the challenges?

CT: As a small firm with 40 employees, one major challenge is establishing the right depth to ensure capacity to meet client obligations without having to much staff, which can be costly during slow periods. Also, it's always hard to recruit the against larger firms. Small firms like mine offer employees a wide variety of assignments and more responsibility, so we leverage that to our advantage.

PE: What are some of the lesson learned?

CT: Most firms, especially small ones, have to learn not to overcommit, and to be careful about new service offerings. In the past we have undertaken assignments and responsibilities which were new to us when we didn't have the right resources to get the job done. We had to figure out what we can do, and what we can't do. Also, it's hard to learn when to say no. Some of those experiences were painful. In one case we responded to an emergency request from a client, to help them meet a tight deadline for their client, which required us to overwork nearly the entire technical staff for about three weeks straight. We got the job done, but were late with two projects for one of our oldest and dearest clients, which cost us some business from them.

Venture Engineering & Construction

by: Don Olmstead

The Story

Venture Engineering & Construction was founded on December 3, 2007 after the employer of our three founding partners was acquired by an equipment manufacturer. Since the new owner was not interested in providing traditional consulting engineering services any longer, we saw an opportunity. We reached out to two other partners in real estate, and formed Venture.

We decided that we would offer multi-disciplinary engineering services to the process and energy markets, and pursue other markets opportunistically. We planned to differentiate ourselves by providing a process engineering focus. We quickly found financing, through a customer, as well as immediate backlog. We were simultaneously hiring, looking for space, putting together a benefits package, getting insurance, purchasing an enterprise system, finding an accountant and an attorney, and all the other things that go with starting a business.

The interval between the announcement of the acquisition (of the firm we were working at the time) and the formation of Venture was four weeks, and another six weeks until we moved into office space and hired our first employee. This would not have been possible without preparation – The old adage attributed to Seneca very much applies: “Luck is what happens when preparation meets opportunity.” In our case each one of us had some degree of entrepreneurial experience or interest; we had all been looking at the systems and tools of our past employers and thought about what we would do the same and what we would do differently given the opportunity; and we all had some sales experience. We all paid attention to what we were doing and had the same values. Our real estate partners had additional insights and contacts. With that background, we were able to act quickly when an opportunity presented itself.

On January 15, 2008 the three of us and our first employee moved into a 7400 sf finished space on Washington’s Landing. The hiring process began. Our approach was to hire from the top down, and reach out to colleagues. We also had some “walk-ins”. Over time, we relied more on recruiters.

In our first year we grew rapidly on BioDiesel projects, until high feedstock costs dampened that market. The following year, we found ourselves working in steel, and frac water treatment, as the replacement engineering firm on the first and only facility to perform evaporation and crystallization of frac water.



Venture Partners, from left: Steve Kranz Don Olmstead, Dave Moniot

Early efforts to develop the landfill gas market bore fruit from the third year on, with Venture getting involved in many landfill gas plants. This work is a specialty field; landfill gas requires considerably more cleanup than mineral gas. Most of the work was design for conversion of landfill gas to pipeline quality gas. We were also getting traction in some of the more traditional markets – refining, specialty chemicals, and coatings and resins.

In August 2010 and again in August 2011, the Pittsburgh Business Times recognized Venture Engineering & Construction as Pittsburgh’s fastest growing privately owned company in the environmental/ engineering/ energy category.

Our Chief note that our

Technology Officer, Bill Slatosky, began to landfill gas customers were complaining about an organic compound that was harmful to stationary IC engine generator sets. From that need we developed a process equipment skid that could remove these harmful organic compounds (siloxanes) in a cost effective manner, thus reducing our customer’s operational costs. Our first sale occurred at the end of 2010, and to date we have equipment at nearly 30 landfill gas and digester gas electricity generating sites throughout the U.S and Canada. We worked with local equipment fabricators to build our



Venture’s first gas conditioning skid

product, rather than invest in our own fabrication shop. This success has led us to the development of several other process skids geared towards the Marcellus and Utica shale producers including a glycol dehydration skid, a CNG no freeze pressure reducing skid for field gas service, and a mobile field condensate splitter/stabilizer. In 2011, we also acquired our Las Vegas office. At the time the focus of the office was commercial/institutional work (MEP), but we needed a platform from which to serve our west coast customers, and we needed west coast PE registrations. Although the

industrial market is not as strong as it is in the east, there is a robust mining market, in particular with respect to mineral processing. We found this to be a natural fit with our east coast industrial experience and we have been making in-roads into the mining market ever since.

At the beginning of 2011, we had outgrown our space on Washington's Landing, and moved into 10,500 sf in the Cardello Building by the West End Bridge. In late 2013, we added 3500 sf to our space.

In 2014, we expanded our equipment line to address the needs of the shale gas market. Time will tell how well that is received, but we have seen early signs of interest.

Staffing has ebbed and flowed like all companies in our business; currently we have approximately 60 employees, having peaked at 75 in 2013. Our goal is to grow to 100 in Pittsburgh in the near term, and to grow the Las Vegas office to about 20, based on mining. We expect to accomplish that within a year.

Some of the obstacle we encountered included staffing and our customers. Initially, a lot of people who liked the idea of a ground floor opportunity in a start-up just found it to be too big a step when the time came to move. In the end, alot of people found a start-up to be outside their comfort zone. As for our customers, we had a number of customers who we thought would follow did not, until after we had been around for a while. There was the reluctance of certain people to work with us, either as staff or as customers.

An obstacle that we did not anticipate was the development of a sense of "team". Bringing many new people together in a new organization was more difficult than we anticipated. All the partners had come from mature organizations.

One thing that did not materialize was finding working capital. It was easier than I thought to find capital, and it was easier than I thought to commercialize our technology. Some serendipity was involved here.

Looking back, if I had the chance to change something, it would to have been more observant. Although I was observing before we formed Venture, and those observations benefited our start, I realize now that there was a lot that I missed. I would have paid more attention before we started Venture. I would also have been better at maintaining my contacts, as you never know who may help you.

Probably the toughest hurdles we faced were staffing, cash management, and getting peoples priorities aligned. I can't pick just one!

In the end, the inspiration was a great opportunity to try out some of my own ideas with respect to marketing, management, executing projects, and the like. Also job security. As I saw it, I would have more of it depending on myself and my partners, than working for somebody else. I had been down sized twice because of the economy by large multi-national engineering firms, and that affected my confidence in counting on somebody else as my employer.

About the Author...

Don Olmstead has over 30 years of engineering experience. He has worked in equipment fabrication, environmental consulting, design, construction, and mining. He holds a Bachelors engineering degree from the University of Guelph, Ontario, and a Masters degree from the University of Pittsburgh, Pennsylvania. His partners at Venture are Dave Moniot and Steve Kranz, as well as two partners in real estate. He can be reached at (412)231-5890 x 302, or at dolmstead@ventureengr.com.

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The Entrepreneurial Spirit in a Family Business

By John C. (Jack) Mascaro, P.E. LEED AP BD+C

I believe that entrepreneurship is making things happen in a timely fashion. It is also a calculated risk. According to the West Point adage, “A calculated risk is a known risk for the sake of real gain. A risk for the sake of a risk is a fool’s choice.” My advice is ... if you don’t like the risk, don’t get in the game. However, when I started Mascaro, I didn’t see it as a risk; I saw it as an investment for me and my family.

How to get started – Vision and experience

In April 1988, Mascaro Construction was born on a ping-pong table in the basement of my home. One of the biggest obstacles the company faced as a start-up construction firm was bonding capacity. So at 44 years of age, I got a second mortgage on the family home and provided a personal guarantee to the bonding company so I could follow my dream and vision.

This vision was about creating something missing in the construction market. Mascaro Construction would be a company of great builders with an engineering background with high technical skills who brought professionalism, integrity, honesty, transparency, and trustworthiness to the industry. I wanted to raise the bar for “permission to play” in the construction game.

My goal wasn’t to be the biggest; it was to be the best. With more than 24 years in the industry prior to starting my company, my learning curve was minimal. I understood the volatile construction industry and the many obstacles that it could place in my path. The vision for Mascaro was to change the construction status quo, and our mantra became “do things right the first time.” The underlying principles of the firm would encompass treating people fairly and with respect.

...the industry taught me that growth for growth’s sake was tantamount to disaster. Growth has to be sustainable and profitable...

This formula for success has worked well. Over the past 26 years, Mascaro Construction has been associated with numerous landmark projects, from the Silicon Valley architectural style of the original high-tech FORE system buildings in Warrendale; the world-class research facility, Biomedical Science Tower 3 for the University of Pittsburgh; to the powerful mass of concrete and steel that forms Heinz Field on the NorthShore. The firm has grown steadily and is recognized and respected as one of the top construction contractors in the market.

While I didn’t have any formal growth plan, my experience in the

industry taught me that growth for growth’s sake was tantamount to disaster. Growth has to be sustainable and profitable. My initial goal was to be a \$30 million per year contractor. That changed as the company grew. We would get caught up in the excitement of the big jobs, the chasing, procuring, and building.

There were two factors that kept the company moving in a positive direction. First, we remained a private, family-owned firm. When you are a private company, you have the freedom to operate toward the long-term. You are not beholden to stockholders. Second, and a very key factor, is to hire and keep great people.

Without

a doubt, Mascaro’s success is attributable to its people.

Mascaro grew by leveraging the entrepreneurial and engineering talents of the people that were hired. Not only did they have great talent, they shared in the vision of being the best at whatever we did. We didn’t want to be in the commodity business, where people bought on price alone. We wanted clients to hire us for our expertise, knowledge, experience, and professionalism – price should be secondary. We still think that way today.



Creating a Family Atmosphere

I am truly blessed by being able to maintain a family atmosphere at Mascaro over the past 26 years. We genuinely care about our people; every employee is considered a family member.

This is evident in the company’s commitment to the well-being of employees through an unwavering commitment to safety, continuing education programs, generous benefits, and an on-site gymnasium supported by a wellness coordinator. It extends to supporting charitable and community organizations where employees’ interests – and hearts – are most engaged.

In an industry where the turnover rates, according to the Bureau of Labor Statistics, average over 5%, Mascaro’s turnover rate is 3.6%. The benefits to a firm with low turnover rates are improved productivity and fewer administrative costs resulting in improved profits, which Mascaro also shares with its employees.

The fact that my three sons, John, Jr., Jeffrey, and Michael, all joined the business helps cement the family atmosphere.

When I started this business, I knew I wanted to work with my three boys, but they were not sure about doing that. One was in college and two were in high school, but I figured I could persuade them by exposing them to the construction business while they were going to school. Once they graduated, they all decided to jump on board. It was easy.

FACTS:

80% of the world's businesses are family-owned.

57% of the U.S. GDP comes from family businesses.

63% of the U.S. workforce is employed by family-owned businesses.

(Source: *Exceptional Magazine*)

MORE FACTS:

30% of family businesses survive into the second generation.

12% are still viable into the third generation.

3% of all family businesses operate into the fourth generation or beyond.

(Source: *Family Business Institute*)

Succession planning was an important part in keeping Mascaro successful as we transitioned from father to sons. In 2007, I turned over the reins. John, Jr. is president and CEO; Jeffrey and Michael are executive vice presidents. My role is as chairman and advisor.

As I watched the transition one thing was clear – this next generation of entrepreneurs holds steadfast to the core values that created Mascaro. This was apparent as we made the initial transition. One of my final acts as president was to commission a 20th Anniversary History of Mascaro book. As the writer interviewed each of my sons, she was impressed with their pride and commitment to carry on with the core values established more than 20 years before.

“We want to maintain the close and intimate family atmosphere that my dad established,” said John. “We want to continue being the best. We want to talk, walk, and breathe the values our dad instilled in us.”

Adds Jeff, “We never want to lose our ability to touch, taste, and smell the essence

of this company. We want to be able to walk into any employee's office and have a conversation. We've grown up with them. They are part of our extended family.”

The most helpful thing was clearly defining our roles. Our positions descriptions are very succinct just to make sure we're not tripping over each other

My sons understand this and are on board with the thinking that you have to work here to have ownership rights. John's oldest son is 19 and studying civil engineering at Carnegie Mellon University. (As a side note, my father graduated from the University of Naples in 1916 with a civil engineering degree. And when John's oldest son graduates in 2017, he will represent 100 years of civil engineers in the Mascaro family over four generations.) The hope is that he will come to work for the company. My hope is that John has learned a trick or two from his father about enticing your children into the family business.

The Legacy

The legacy I want to leave is that of a good leader and professional builder who was a visionary and who cared about his people. I don't want any monuments. I just want the Mascaro name and company to survive and be passed down from my children to my grandchildren to my great-grandchildren and beyond. That will happen only if we instill in each generation the core values the Mascaro name represents.

I'm confident that the company is in good hands and the family atmosphere will remain strong. Family companies work harder at the culture of the organization. They are already tuned in. And who do you love more than your family?

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of this company. We want to be able to walk into any employee's office and have a conversation. We've grown up with them. They are part of our extended family.”

Summing it up, Michael notes, “My dad built this company, and it is now our job to continue the tradition of excellence. How we run this company will be a testament to who he is.”

That's not to imply that all has been sunshine and roses. John and I were recently interviewed for an article in *Exceptional* magazine (a publication by EY) on family businesses and how the unique cultures and dynamics mesh. John summed up the transition as follows.

“When my brothers and I took over, it was great because, up until that point, we didn't have any overlap. My dad was the clear boss, and we did our separate things. When we introduced the overlap, the family dynamic came into play. The most helpful thing was clearly defining our roles. Our positions descriptions are very succinct just to make sure we're not tripping over each other.”

It was a major adjustment for me as well. Sometimes I am viewed as dad, just being a pain, versus the boss who wants things done in a certain way. I've learned I can't go in every day, because I like to control things; and if I go in there, I'm going to try to take over – and that isn't right.

The next biggest challenge for Mascaro is the transition from second generation to third generation. There are nine children among my three

An Entrepreneurs' Story

Collective Efforts, LLC - Civil and Environmental Engineers

The three founders of Collective Efforts (Coreen Casadei, Kathy Chavara and Tammi Halapin) usually start telling the story of the beginnings of Collective Efforts by saying, "We basically fell out of the sky and landed back in Pittsburgh to begin our adventure." The reason that these three professional women engineers say this is because prior to starting Collective Efforts they had worked on a ten-year Department of Defense environmental cleanup program. Although they all lived in Pittsburgh, their civil and environmental projects and contacts were in Virginia, Maryland, North Carolina and Puerto Rico. They had not worked on any local projects in years, and therefore needed to build and rebuild relationships with local contacts and potential clients. Were they crazy for thinking that three engineers could start a firm and be successful? Their inspiration for this crazy idea was the need for each of them to have flexibility to raise families at the same time as succeeding in their engineering careers.

Well they embarked on this adventure on February 14, 2000 and started pounding the local pavement to establish Collective Efforts as a quality civil and environmental engineering firm. They faced many obstacles since that day and learned many lessons which they used to grow their business to what it is today.

The Early Days

The three new entrepreneurs found themselves on that Valentine's Day in one of the partner's basement wondering where to start. The first of many hurdles was just identifying what they had to do to legally become a company. What about a corporate structure? What about a bank account? What about office furniture, telephones, computers, printers, software, and an accounting system? What about an attorney and an accountant? Tax liabilities and insurance coverage were needed. They were faced with many upfront administrative decisions to be made even before thinking about getting projects in the door. They registered to work in Pennsylvania and came up with a company name, Collective Efforts (which was inspired from the three owners collectively working so well together when they met). They decided to become a limited liability company based on discussions with accountants and lawyers. Their easiest decision was their corporate color...purple; a favorite of all three owners and a bit different for an engineering firm.

One of early obstacles they faced was obtaining a line of credit with a bank. Of course banks are conservative and do not loan money or credit to new startup companies without collateral. Well the new entrepreneurs found out quickly that to obtain a small \$25,000 line of credit, they had to put all three of their houses up for collateral! Fortunately, the need for such personal collateral changed once the business was more established and the lenders recognized potential growth and worth.

So now Collective Efforts was ready, willing and able to start developing a successful company in Pennsylvania. But things weren't just that simple; there were many obstacles along the road.

Project-Related Challenges

The economy was not thriving in Western Pennsylvania in 2000; at least not for the civil and environmental engineering fields. Collective Efforts' owners realized early on that projects that they considered small and well within the capacity and experience range of Collective Efforts were also being pursued by the large established engineering firms in the area. If the economy had been better, these larger firms might not have bothered pursuing these smaller projects. They did and often these larger firms were awarded the projects. Collective Efforts quickly learned that their best chance of getting work in the door was by teaming up with these larger engineering firms as a subconsultant.

A major problem with approaching the larger firms, or primes, was that Collective Efforts and its owners were basically an unknown to most of these large companies. As previously mentioned, the owners had been working in other areas of the country for several years prior to establishing Collective Efforts. Then add to this the fact that the three

owners were engineers; technical people used to doing engineering work, not marketing! When does an engineer learn to be a marketer? When they need to pay the mortgage!

A problem they faced while marketing was what did Collective Efforts have to offer these large engineering primes that they did not already have in-house? Why would the primes want or need to hire Collective Efforts? They would be giving work away that their own employees could do. Since the economy was not booming, most of the local primes did not have an overload of work. Now if Collective Efforts

...What about a corporate structure? What about a bank account? What about office furniture, telephones, computers, printers, software, and an accounting system? What about an attorney and an accountant? Tax liabilities and insurance coverage?



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ESWP Member News

More than 80 firms are represented in the Corporate Member program of the Engineers' Society of Western Pennsylvania (ESWP). Memberships are available at 3 levels: Gold, Silver and Bronze. Gold members are entitled to 14 memberships that can be exchanged by employees; Silver, 9; and Bronze, 5 — annual dues are \$2400, \$1700, and \$1000 respectively. In addition, ESWP Corporate Member Firms may add 2 additional individuals in our Under-35 age category at no additional cost. More information can be found at eswp.com. Please contact the ESWP Office (412-261-0710) for additional details.

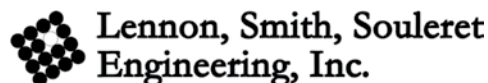
NEW! For Government Agencies, Corporate and Individual Memberships are available at a 50% discount!

Membership in ESWP comes with a long list of benefits! From our continuing education opportunities earning you Professional Development Hours (PDHs), to the business networking events in our fine dining city club, there is something for everyone in your organization. Also, ESWP is helping the next generation of engineers with student outreach programs, giving you the opportunity to participate in many rewarding programs.

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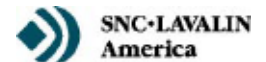


ESWP Silver Corporate Member Firms



Uhde Corporation

ESWP Bronze Corporate Member Firms



had a special niche or if they were a disadvantaged business, they would be a potential asset to these large primes.

As a solution, Collective Efforts owners started the long process of becoming a certified women owned business enterprise (WBE) with various agencies. Within six months, Collective Efforts was certified as a WBE and/or disadvantage business enterprise (DBE). The owners found that this certification allowed for our foot in the door and allowed the firm to market to a broader market (public sector) where DBE goals were well established. Collective Efforts did not want to be given work just because of their WBE certification; the owners were determined to

*When does an engineer learn to be a marketer?
When they need to pay the mortgage!*

obtain repeat work based on the quality of their engineering work and values.

Marketing Obstacles

Obtaining WBE certification did not immediately open the doors to new business; Collective Efforts' owners faced many marketing obstacles. They had to learn that they needed an "elevator speech" when they met new people. How do you describe what your company does within a two minute speech and make it sound interesting?

They had to create marketing materials. They were used to writing and preparing technical engineering reports, plans and specifications. How do you document their technical experience in a manner that is appealing to all readers?

They had to decide who to market to. There were numerous prime engineering firms, developers, non-profits, government agencies and authorities and their boards and don't forget the politicians. With only three people, they had to decide where they should focus their marketing efforts instead of thinking they could work for everyone and everywhere. Once Collective Efforts became more established, they expanded their marketing areas.

Networking was one of the most important success factors in marketing. Collective Efforts joined various local organizations and engineering associations. The owners took active roles in many of these organizations and as a result their network of business professionals has grown each year.

The length of time it takes for marketing efforts to pay off can be long. After all of the marketing and proving that you can complete the work, it sometimes takes a long time for an awarded project to actually begin. This can sometimes take months and in some cases even years for the project kick-off meeting. A challenge is to maintain qualified staff, keep them busy (billable) and then nimble enough to transition to the awarded work once initiated.

Managing the loss of anticipated/awarded (often needed) work while being positive and supportive of the prime can be daunting. Situations like this need to be considered from the short-term and long-term business relationship perspective.

We Shall Overcome

The owners of Collective Efforts have learned a lot about business over the last 14 years. They have been successful in solving any issues that arose and are ready to be challenged with more. Collective Efforts has become established in the Pittsburgh area as a "go to" DBE for many engineering services including permitting, civil design, environmental compliance, stormwater management design, sustainability, municipal coordination and public outreach. They are proud of their successfully completed projects and have built numerous business relationships with the larger firms and authorities throughout Western Pennsylvania. Their efforts have been focused primarily on the Pittsburgh Region...working

on projects for the Allegheny County Sanitary Authority, the Allegheny County Airport Authority, the Port Authority of Allegheny County, the Allegheny County Department of Public Works, the Pittsburgh Water and Sewer Authority, and the City of Pittsburgh Department of Public Works in addition to several private clients and developers.

Collective Efforts has recently expanded their focus and potential opportunities by opening an office in Ohio. They look forward to facing similar challenges they did when they started Collective Efforts here in Pittsburgh, but this time they have 14 years of experience behind them to hit the ground running.

Asking Coreen, Kathy and Tammi now, are they glad that they took the jump to become entrepreneurs? I think you would hear a resounding "Yes". They remain focused and passionate about the work they do and appreciate the many opportunities and business relationships they have gained.

Quotes from some of our staff:

"Collective Efforts' flexible schedule allows us to be available to our families when they need us. They allow part-time employees which is a win-win for the company and the employee."...Karen Napoli, Project Specialist

"The culture of Collective Efforts has been built through the various backgrounds, personalities, and interaction of each of its members. This culture allows each individual and the company as a whole to continue to grow and succeed at the highest level.".....Eric Turkovich, Environmental Scientist

"Great office atmosphere and great spirit of cooperation.".....Sue English, Senior Engineer

Quotes from some of our clients:

"Collective Efforts was always a valued member of our project team. We valued their contributions to helping solve some of our most challenging problems and they were always willing to go the extra mile for our team and our client. Their presence on our team was a benefit to us, and our client."

"Collective Efforts has successfully provided adaptive and responsive professional services to ALCOSAN as we meet the evolving challenges to better our environment."

"Whenever I have any questions or concerns about potential wetlands I quickly call Collective Efforts". Their staff is quick to respond and thorough in their investigation. They have always provided quality work at a fair price."

"Collective Efforts has consistently delivered high quality work, on time and within the project budgets. They have been a preferred partner for many years and have proven themselves as a reliable sub consultant for a variety of our clients. "

"I have always enjoyed working with the principals and staff at Collective Efforts. They have been professional, responsive, and provided quality work that met or exceeded our clients' needs. I have worked with Collective Efforts for over ten years on multiple projects and have never been disappointed with their service."

"I would like to take this opportunity to extend my thanks for your staff's hard work in providing exceptional services for getting this last Basin Facilities Plan completed in time and on target while meeting expectations which I am certain are well-above "industry-standard". I continued to be impressed by your company's willingness to work on a variety of tasks that could change at any time based on new information or prioritization of work products. I also valued your staff's ability to communicate clearly and effectively to make remote work possible and successful."

Taking the Plunge into the Unknown

Essential Principles of Becoming an Engineer/Scientist Entrepreneur

By: Mark R. Urbassik and David R. Kerschner

When we look back at the beginning of our firm, KU Resources, Inc., we think it is instructive to share our prior experiences and discuss the development of business technology that enabled, not only us, but many other similarly-minded environmental consultants to “get in the game” and compete on our own. When we established the company in 1997, we had already gained over fifteen years of varied experience, including time with both corporate environmental staffs and larger outside consultants.

The environmental field in the 1980s was undergoing explosive growth, fueled by the initial major federal laws dealing with clean air, clean water, hazardous waste management, and abandoned waste disposal sites. From personal perspectives, we were very fortunate to work for a heavy industrial company facing practically all of these new challenges. As a result, the company decided to internally manage these issues and aggressively hired staff to do so. The company provided on-the-job training in our respective fields, essentially unobtainable from a consulting firm. However, approximately a decade into our careers, our company went through a hostile corporate takeover and, to make a long story short, we were quickly thrust into becoming members of the consulting industry. As the 1990s progressed, we “learned the ropes” of independent consulting, and developed new skill sets complementary to those we developed as on-staff technical people.

As our consulting careers developed, we ultimately found ourselves working for well-known large environmental consulting firms. Although these firms provided gainful employment, we both experienced the same shortcomings: excessive corporate overhead and loss of client focus. These issues resulted in career-direction evaluations by both of us. We both came to at least one identical conclusion: our long-term job security rested with our clients, not the companies employing us. Why not establish a new firm based upon our values?

While our experiences were developing, a significant technological advance was occurring with the development of the Internet. Although most engineering and scientific fields are shaped by laws, regulations, and ordinances, none were as driven by them as the environmental laws. Access to such information is essential to being an environmental consultant. Prior to wide-spread internet access, a significant impediment to establishing a small environmental firm was the ability to quickly refer to pertinent regulations. The larger firms were able to build large reference libraries. By the time we were ready to establish our business, all we needed was a computer to quickly access all the information essential to providing quality services.

You don’t just start a technical consulting business without thinking about what services you will provide, which clients you think might hire you, and where you will operate. Collectively, the answers to these questions result in the establishment of your market niche.

Practically all successful small technical consulting firms have focused market niches, which allow them to compete with larger firms. We had two specific initial market niches – one was industry focused (wood treating, based upon industrial experience) and the other was regulatory focused (brownfields, based upon experience gained in our prior consulting careers). We continue to work in these areas today, although we have to be able to add new markets niches as our company grows.

If you can bring past relationships with you to a new venture, take advantage of the opportunity.

Another essential consideration to evaluate prior to starting a company is the administration of the company. Who will perform the mundane (payroll; billing; accounting; accounts payable and receivable; legal; human resources; banking)? Do you need to pay for outside support on some or all of these functions? What systems will be needed? With regard to these types of questions, a new entrepreneur would be wise to reach out to colleagues who have already established businesses for themselves. In our experience, we found that engineers and scientists were very willing to provide recommendations and referrals to help us get started. If you can bring past relationships with you to a new venture, take advantage of the opportunity. The more you can rely upon trusted service providers, the more time you can devote to other areas in more need of your attention. Don’t think that everything has to be brand new, just because it’s a new company.

Once we con-



Pressure treating lumber then...and now...



vinced ourselves that we had the ability, market focus, and administrative acumen to provide quality services while making a profit, the most difficult step remained – TAKING THE PLUNGE! There will come a time when the analysis and planning needs to end, and the articles of incorporation filed. Off to the great unknown! Engineers and scientists are known for their systematic approach to technical matters, not dealing with the numerous twists and turns that are inevitable in running a business. We were lucky because our collective experience touched upon practically all the facets of a new business. Nevertheless, you will never be absolutely certain of success.

The most important operational procedure for the engineer/scientist entrepreneur is, in our opinion, to be nimble and quick. This attribute can really distinguish an upstart firm from larger, more established businesses offering similar services. The ability to make real-time decisions and commitments to clients from the senior level of an organization wins projects. It is one of the innate characteristics of a small company that practically no large firm can offer.

As our company grew, we began to incorporate some of the practices of larger firms while trying to stay true to our client-focused, common-sensical approach to business. We spent some time (not weeks on end) refining our mission statement, values, and vision for the company. This is a worthwhile exercise once you have the firm running smoothly. We also upgraded accounting systems to allow us to compare the company to others.

Owning your own company is very rewarding but brings with it a whole different set of obligations. It isn't for everyone, and thoroughly thinking about who you are helps make the decision. Perhaps this is the essence of the decision to become the engineer/scientist entrepreneur.

About the Authors...

David R. Kerschner, CPG - Mr. Kerschner, Principal of KU Resources, Inc., is a hydrogeologist who began his professional career in 1981. He has substantial experience in conducting and managing environmental investigations, feasibility studies, and remedial actions at operating and former industrial facilities. He also has extensive regulatory management experience under Resource Conservation and Recovery Act (RCRA), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and various state statutes. He is a Certified Professional Geologist and a registered Professional Geologist in Pennsylvania, Florida, Indiana, Tennessee, Kentucky, and Georgia. Mr. Kerschner holds a BS in Environmental Science from Allegheny College and a MS in Geology from Kent State University.

Mark R. Urbassik, PE, JD, LEED AP Neighborhood Development - Mr. Urbassik, Principal of KU Resources, Inc., has more than 35 years of experience in the environmental regulatory field and is a key provider of environmental science, engineering, remediation, program management, and project management services related to soil and groundwater environmental issues. He is serving as an appointed member of Pennsylvania's Cleanup Standards Scientific Advisory Board, which advises the Pennsylvania Department of Environmental Protection management of technical ramifications associated with their actions under Pennsylvania's Land Recycling Program, including guidance and regulations. He has developed project strategies and approaches for a number of brownfield projects, including former industrial locations seeking to meet risk-based standards and implementing institutional controls and sites within specifically-designated economic recovery zones. He is a licensed PA P.E. and a LEED® Accredited Professional in Neighborhood Development. Mark holds a BSCE from Drexel University, a MSCE Engineering from Stanford University, and a JD from the Duquesne University School of Law.



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PA OFFICE: (412) 722-1970
 Amy L. Veltri, P.E. BCEE - aveltri@ngeconsulting.com
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Engineers and Entrepreneurs at Novel Geo-Environmental

By Amy Veltri



Amy Veltri -Principal, NGE

Do engineers make good entrepreneurs? That question could go either way. There are many that think engineers are often too introverted or anti-social to lead an organization effectively. However, there have been numerous outstanding entrepreneurial engineers throughout history including Thomas Edison, the Wright Brothers and one with a Pittsburgh connection, George Westinghouse. I grew up with an entrepreneurial engineer – my father was the founder of an engineering firm so I got to witness firsthand the trials and tribulations of being an engineer and an entrepreneur.

A degree in engineering can prepare a person well for becoming an entrepreneur. Although you certainly learn numerous technical skills while pursuing your engineering degree, one of the most valuable skills learned is problem solving. Pursuing an engineering degree and the associated course work leave you poised to methodically think through problems (both personal and professional) and this is a skill that serves entrepreneurs well. Engineers are also trained to pay attention to detail, another skill that is useful as an entrepreneur.

I earned a Bachelor of Science and Master of Science degree in Civil Engineering and worked for 15 years in both industry and consulting before starting an engineering firm with a business partner (who also happens to be my brother). The decision to start our own firm was difficult but after much discussion and planning, we decided we had a unique concept that supported our existing expertise and in 2002 we founded Novel Geo-Environmental, LLC (NGE). Some of the key items that make NGE unique are:

- Specialization in environmental compliance regulatory issues;
- Specialization in geotechnical engineering, with a geotechnical practice that includes own drill rigs; and
- Certification as a Disadvantaged Business Enterprise (DBE) and Economically Disadvantaged Woman Owned Small Business (EDWOSB)

One of the most important lessons I learned from observing my father start and grow an engineering practice that has served me well as an entrepreneur is to never compromise your integrity. It doesn't matter how difficult it may make your life or the financial implications there may be, your decisions have to be sound morally and ethically throughout your career. If this serves as your primary guidance, you cannot go wrong.... even if you fail you can still live with your decisions and feel good about yourself.

There certainly have been numerous obstacles encountered since founding the business but some of the larger hurdles have been personnel and resources. As a services-based business, our staff are our most valuable assets. It has been difficult to attract and maintain high quality loyal personnel who share the same values. Over the years, we have put incentive programs in place to address this issue (and they have had success). Needless to say with personnel come H.R. issues which are always

extremely difficult. Dealing with these sensitive issues in a confidential, compassionate manner is important. You get involved in people's lives in ways you would never imagine.

As a small business owner, resources are always limited. When starting the business, I never imagined I'd learn so much about various topics such as marketing, finance, accounting, insurance, benefits, human resources, legal and contractual matters and numerous other topics. Since resources are limited, it is extremely beneficial to find firms that can support you with such matters when needed such as attorneys, H.R. experts, benefits experts, accountants and insurance brokers.

A frequently heard proverb is "Without risk there is no reward". Certainly there is risk in being an entrepreneur but it has proven to be quite rewarding too! While there have been many mistakes made, I wouldn't change any of them as each and every one has brought with it a unique learning experience.

When people ask me what it's like to start and own a business, I tell them it's difficult to explain unless it's something you've experienced before. I compare it to having a child – you have to plan extensively before and nurture it to help it grow. As someone who has experienced both having a child and starting a business, I'm somewhat of an expert in these matters!

NGE is an award-winning environmental and geotechnical engineering consulting firm currently certified as an Economically Disadvantaged Women Owned Small Business (EDWOSB) and a Disadvantaged Business Enterprise (DBE). Established in 2002, NGE has grown into a leading environmental and geotechnical firm with a broad geographic reach, having worked in the majority

of the United States and several international locations. NGE's professional staff includes engineers, geologists, and environmental scientists with many staff members holding professional licenses and registrations.

Exceptional services have resulted in subsequent growth for NGE and as a result, NGE has earned the following prestigious awards:

- Woman Owned Business of the Year – the U. S. Small Business Administration Pittsburgh District honored NGE with this award in 2008.
- Top 10 Fastest Growing Environmental Services Firm in the U.S. – NGE was named one of the Top 10 Fastest Growing Environmental Services Firm in the U. S in 2009 by Inc. Magazine.
- Among the Fastest Growing Companies in Western PA – NGE has been included in this annual Pittsburgh Business Times list several times since 2007, when NGE was named the fastest growing engineering firm in the Pittsburgh area.
- In 2011 and 2013, NGE was named as one of the best environmental service firms to work for in the U.S. by ZweigWhite.



RED SWING

GROUP

By Erin Hart and Robert McCollim, P.E.

As a youth growing up in rural Indiana County, Matthew Smith spent many evenings with his late grandfather on the beloved red porch swing that the family patriarch had hand crafted. The young Smith spent those evenings absorbing advice about building trustworthy relationships, the importance of being ethical and showing integrity, not making excuses, and spending wisely. These are the core values Smith's grandfather instilled in him at an early age and which have always framed his approach to life and his philosophy in business. This core ethos and the original red swing, which now hangs between two trees at Smith's home, were the inspiration for the creation of Red Swing Group and Smith's foray into entrepreneurship.

The Educational Beginnings

Growing up, academics were never at the forefront of Smith's focus. After an average high school career, Smith's first attempt at continued education found college to be a difficult endeavor due to the "attraction to the social scene of college life." Realizing the need for discipline, Smith enrolled in the United States Marine Corps. His time with the Marines instilled the focus, drive and personal discipline needed to seriously pursue his education and desired career path in the architectural and engineering industry.

Disciplined and ready for hard work after his time in the Marines, Smith restarted his career path with enrollment in the Specialized Technology/Architectural CADD program at Pittsburgh Technical Institute (PTI). Upon completion of the PTI curriculum, Smith started working full time as an architectural CAD drafter and quickly realized that continuing to expand his education would be fundamental to the advancement of his career prospects. Smith made a thoughtful consideration of his career aspirations and enrolled in the Civil Engineering program at Point Park College (now Point Park University).

It was in this structured environment at Point Park that Smith flourished. While maintaining his full time drafting position at Tasso Katselas Associates, Smith completed his Point Park coursework four evenings a week and on Saturdays. The schedule was grueling, but Smith knew his drive and determination would keep him focused to secure his degree, which he did in 1993. Smith's collegiate academic credentials far surpassed his high school days. At PTI, he consistently achieved High Honors on the National Dean's List; and at Point Park, he was inducted into the National Honor Scholarship Society as a Magna Cum Laude.

The Leadership Path

Fresh out of Point Park, Smith explored several career opportunities including highway engineering, coal plant extraction detailing, highway construction cost estimating, and 3D site modeling of steel plants. "The lack of personal interaction in these positions was depressing," Smith said. "I was one of many in a cube farms. No one conversed; there was no interaction. I decided then that I needed to create something that I enjoyed – something that got my energy

flowing; something that facilitated collaboration and interaction."

As a side job while working these contract positions, Smith created Matt's Drafting Services, a company that specialized in residential additions, site plans and perspective colored renderings for architects and private owners. Smith enjoyed the work, being his own boss and building a business. However, the workload did not grow enough for Smith to devote full-time effort.

Later roles as a site civil engineer working in land development gave Smith the interactive experience he craved – and the opportunity for growth and development that would be needed in later years. "When I entered the land development and site design arena, I knew that this was what I wanted to do," Smith said. "In these roles, I was interacting and collaborating with the client, township officials, city councils, attorneys, utilities, contractors and stakeholders. You have to be organized, interactive and driven to succeed in this engineering discipline, or you won't survive."

In October 1997, Smith came on board with STV Incorporated as a land development engineer. A year later, after the previous civil engineering group manager had left, Smith was asked by his office manager if he wanted to be groomed to lead and build the firm's civil engineering group. Smith agreed, and by 2005, his group had 19 people locally and many

others across the country in other STV offices working on projects he managed. By all accounts, he was happy and enjoying a satisfying career.

The End was Really the Beginning

Just as Smith's group was reaching its pinnacle, in 2005, STV underwent a company-wide reorganization that eliminated the Pittsburgh office manager position, realigned department hierarchy and nearly obliterated Smith's team.

"This was a tremendous hit," Smith said, "and left me wondering how stable my position was – and what I should do next. Many clients and peers I spoke with encouraged me to strike out on my own and it wasn't far-fetched, for I had side jobs offered to me along the way. But I couldn't take them because I had a wife and young kids at home, and I needed stability."

Due to his lack of confidence in his company's long-term plans for the site civil group in Pittsburgh, Smith opted to follow this advice and his entrepreneurial spirit. In late 2005, he created Red Swing Consulting Services, LLC as a backup plan. The company, named after the treasured red porch swing that his late grandfather had built, enabled Smith to create an exit strategy as STV was in the process of restructuring. Just as he was set to resign from STV, the company's National Director of Land Development, Tony Cortael, entered as Smith's new boss and encouraged him to stay with the promise that the company would provide Smith with what he needed to both rebuild the Pittsburgh civil engineering team that was dismantled and achieve professional success. All that was asked of

...with a lump in his throat and the support of his wife, (he) took out a second mortgage on his house and cash advances on several credit cards so that his family could survive while he built the foundation of his business...

Smith was to commit to one year. One year turned into two, then three and a senior management role was within reach when the bubble burst in the economic downturn of 2008.

“Each time Tony came to the Pittsburgh office, we always spent time talking and reviewing projects, opportunities and such. But this time was different. When we went into the conference room, he shut the door. And Tony never shut the door. I instantly knew my time there was done. And now it was time to pick up the pieces and plot my own course.”

Building a Business

As 2008 came to a close, Smith met with previous clients, peers and other engineering companies, trying to weigh his options. Several engineering firms proposed arrangements that would have had Smith joining their team and bringing in his experience and network of clients. With a desire of stability for his young, growing family, he opted to proceed with one of the offers only to find out a few weeks later that the opportunity was not a good fit.

“As I was bringing my long-time clients and development contacts into play with the new firm, I had so many of them ask me what I was doing – meaning, trying to sign on with another company as an employee,” Smith said. “Everyone continued to encourage me to strike out on my own, to be my own boss and create my own path. It was frightening.”

With a lump in his throat and the support of his wife, Smith took out a second mortgage on his house and cash advances on several credit cards so that he and his family could survive while he built the foundation of his business, Red Swing Group. “It was nerve-wracking wondering if this was all going to work,” Smith said. “But I was confident in my relationship building skills, industry knowledge, and I had a solid plan. I had met with my financial adviser, accountant, and attorney to project the revenues needed to run the company and support my family. This plan bolstered my confidence that I could make this work.”

In January 2009, Red Swing Group officially opened for business from the basement office of Smith’s home. Starting with three projects – an office building, a restaurant and a brownfield redevelopment, Smith knew that a focus on networking and client relationship building would be critical to business development and the growth of the company. Through countless hours networking, additional projects were secured and the workload had exceeded what a single person could handle. By the end of the first year, Smith was holding regular weekly staff meetings to coordinate and organize workload with two full-time and a handful of part-time employees.

The first two years were challenging for Smith. Business was beginning to rebound from the economic recession and the marketplace was competitive. As a new business, bank lines of credit were difficult to obtain, making accounts receivable and payroll a constant focus. Smith had his doubts at times, but was determined to succeed.

Heeding his grandfather’s words of “do a person right”, Smith built trust in his growing team and returning clients. “I have been commended by clients and architects that Red Swing is the most engaged and communicative civil engineer they’ve ever worked with,” Smith said. “We are well-respected for our integrity, interaction, communication and trust.”

By 2011, Smith moved the Red Swing operations from his home office into its current location in Murrysville.

“Our line of work – land development – is built on team collaboration and interaction, and that is hard to do working remotely. For Red Swing to grow, work effectively and succeed, we needed to be together in one location.”

The company is indeed successful. Since moving to its Murrysville location, it has increased its staff to 12 and experienced nearly doubled growth each year. Red Swing also expanded its public-, private- and commercial-client service offerings from its civil and land development

beginnings to include landscaping, environmental and telecommunications.

Smith values the mentoring he’s been exposed to over the years from several individuals that have helped him grow as an entrepreneur – many of whom are also entrepreneurs. Smith credits his success to much of the lessons he learned from them, namely project management practices, networking skills and listening to people – all of which are needed to build relationships and gain trust.

He encourages anyone wanting to blaze their own path to follow their dreams – but to have a solid game plan, one that includes how to acquire and manage clients, as well as how to manage payroll and payments.

“When I was setting up Red Swing Group, I spent a lot of time talking to anyone who would listen – by phone, in person, you name it,” Smith said. “People want to talk and share advice. No one will fault you for trying to start your own company. You need to have realistic expectations of the effort it takes to not only create your vision, but also to sustain it.”

“I’ve been fortunate in that everyone on my Red Swing Team is in tune with my vision for the company, but they are also not shy about correcting me when I get off track. They know my plan – and they support it. There’s no room for naysayers. I receive a great sense of pride when others ask how the company is doing, knowing that I can share Red Swing great news. Would I do it all over again? Absolutely! I have no regrets.”

About the Authors...

Erin Hart is the owner, chief writer and marketer at Erin Hart Communications. Robert McCollim, P.E. is the lead engineer and project manager for Red Swing Group.



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What is Thinkerous?

Thinkerous is an online platform that gives organization members tools to provide feedback and engage the internal and external community in solving the most impactful problems they experience. Organizations can then track and analyze projects from when a problem is identified, to when it is solved.

Imagine that you are an employee inside a larger company; you come across small workflow inefficiencies every day that hinder your work. Who knows, maybe your coworkers have the same issues. In any case, as someone who experiences these problems every single day, you definitely know them better than your manager does.

Now imagine that you are the manager, and have the task of improving the output of your team. Would you speak with this employee to solve these problems? How about the 100, or 1000 other employees? Which problems do you solve first, to impact the most people? Which ideas actually point to the same underlying problem, and which do you choose to implement?

Thinkerous uses machine learning to help communities such as companies, cities, and events prioritize these problems, so that the most important ones are solved first. We want to help you identify and solve the bottlenecks to the innovation strategy of your community.

Thinkerous is composed of Aaron and Chris, from Carnegie Mellon University, and Cheeyoon, from the Southern California Institute of Architecture.

P.E.: What was your inspiration?

Arriving as a freshman at Carnegie Mellon University, I was immediately surrounded by highly technical and capable people. Soon, however, I realized that it was very hard for people to start conversations about projects they wanted to do outside of class. It wasn't that there was a lack of creativity - it was the lack of confidence for the students to even begin sharing their ideas.

Seeking to improve the status quo, I put up a bulletin board in my dorm lounge and populated it with several of my own side projects. One by one, more ideas were posted, and an increasing number of people started planning to actually build these ideas into real products by using specialized skills they learned in classes.

This got me hooked - I loved the feeling of creating something that could help others create things from scratch, in ways they did not think they could.

P.E.: What obstacles did you encounter? What obstacles did you not anticipate?

As much as we were inspired to make this available to everyone for free, in order to keep it sustainable we had to either raise money or have a viable revenue model. Balancing mental investment between building the product, building the company, and keeping the initial inspiration alive was, and is still tough. As 2 engineers and a designer, we hadn't really thought about the "business" in running a business and assumed that if we built something cool, it would work out. After this realization, we sought help from Carnegie Mellon's startup incubator - Project Olympus.

Another obstacle we faced was the fact that friends all say they "love the idea." They also happen to not be our target market. The transition from asking our college age friends for feedback to meeting with managers in large companies was probably the most nerve-wracking period of my life at that point. However, it was also the most productive - it helped us narrow down and prioritize our todo list so that it only contained features companies were willing to pay for.

P.E.: Lessons learned – what would you do differently if you had the chance?

Start earlier. The earlier, the better. I came up with the general idea for Thinkerous when I was a freshman, but mostly sat on the idea until my senior year. If I had started a few years earlier, I would have had a full product done by the time I graduated.

Connections matter. Not just your own, but also your connections' connections. In Pittsburgh, we're extremely lucky in that after going to a few meetups, you'll likely be within 2 degrees of separation between everyone important in your target industry. It's never too early to start building this network, and helps immensely in getting market validation, receiving helpful feedback, finding beta users, and signing on your first customers. I didn't start going to meetups outside the "Carnegie Mellon bubble" until late junior year; not only did that expand my knowledge of what Pittsburgh was able to offer, but also pushed through my toughest hurdle - deciding whether or not I wanted to do this full time. A few more years of interacting with potential customers, potential advisors, and potential partners would have helped tremendously.

P.E.: Toughest hurdle?

So far, the toughest hurdle for the team was deciding when to go all-in to work on the startup. It was my senior year, and all my friends were receiving job offers of at least \$100k. Even within our team, some of us were receiving offers - of which many of our peers would consider their "dream jobs." Did we want to work stable 40 hour weeks with a stable salary? Or did we want to throw that all away to work 80 hour weeks with (at least starting with) no salary? We knew that this decision would affect not only our next few years, but likely the rest of our careers.

A few other milestones have been hard, such as finding the first paying customer. But nothing has come even close to that decision to start.

About the Author...

Aaron Zhang is the founder and CEO of Thinkerous. Born and raised in Southern California, he had only visited Pittsburgh once before moving there in 2010 to attend Carnegie Mellon University for his Bachelor's in Electrical and Computer Engineering. Since graduating in 2013, he has worked full time on the startup in Pittsburgh. Outside of startup work, he participates in OpenPittsburgh, the local Code for America brigade, and helps organize and volunteer at several other local entrepreneurial and technical events.

He can be reached directly at [aaron\[at\]thinkero.us](mailto:aaron[at]thinkero.us). To reach the Thinkerous team, you can email [team\[at\]thinkero.us](mailto:team[at]thinkero.us).

Entrepreneurial Spirit of i+iconUSA

Founded Upon an Early Vision

Infrastructure and Industrial Constructors USA, LLC (i+iconUSA) was founded by a team led by an engineer, Lester C. Snyder III, who has exhibited leadership in the North American construction industry for over 35 years.

To fulfill his ultimate vision for an industry leading company, he chose to foster this new initiative by exemplifying value creation



Les and his father

Photograph courtesy of Les Snyder

for employees, clients and shareholders alike by implementing a strategy of organic growth and amalgamation of other culturally matching smaller

firms through acquisition. As with any entrepreneurial business venture, this growth strategy has risks and obstacles. In conquering these risks, or hurdling obstacles, our culture is never sacrificed, nor our core values compromised, in order to satisfy financial goals.

Les's vision had its roots early in his life, as he is a third generation builder. His grandfather was a fixture in the construction industry of Western Pennsylvania, followed by his father who served as one of Les's mentors. Les's dad, Lester C. Snyder, Jr., peaked his interest in construction at an early age by having him tag along for site visits and reviewing the day's construction adventures during evening dinner. Observing first hand his father's leadership in organizing work crews and motivating their production was an early lesson in valuing people to build a successful construction business.

Instilling his vision even further, Les was also mentored by other University of Pittsburgh Civil Engineering graduates who are venerable names in Pittsburgh construction history, the first being Ish McLaughlin, past President of Dick Corporation, a relationship that remains inspiring, and lives on beyond his recent passing; Bob Luffy, whose legacy as President and CEO of American Bridge Company led and returned this construction industry jewel to its highly regarded stature as an internationally renowned firm; and Jack Mascaro, whose entrepreneurial spirit prompted him to start his own company and grow into a leading, formidable construction entity. Les has taken his mentors' tutelage to develop the vision required to create a nationally recognized construction firm that embellishes the highest values in professionalism with exceptional, customer-driven service, based on providing better solutions.

i+iconUSA has been founded on three pillars: to deliver exceptional

value to its clients; to provide the highest level of opportunity for its employees; and to exceed expectations in building value for its shareholders. The plan for i+iconUSA is to assemble a group of heavy civil and industrial construction companies with similar cultures into one larger organization that can leverage the synergies and specialties of each to provide better solutions for all of its stakeholders.

The first subsidiary brought into the family of i+iconUSA, Joseph B. Fay Company (Fay), has been in the heavy/civil construction market for over 65 years. The company's culture is evolving through fostering of a more entrepreneurial spirit of highly participatory management coupled with a series of executive coaching and mid-level leadership development. In conjunction is the accompanying expansion into the private sector and a more relationship based business philosophy. One major key to this success is maintaining and building relationships with the engineering and design community, who i+iconUSA believes are our partners on every project. As clients are becoming more aware of the efficiencies and higher quality of alternative delivery methods such as design-build and P3, the relationships that we foster with the engineering community becomes of even greater importance



AGC Award Ceremony

Property of i+iconUSA.

An unceasing element in culture and core values of the Fay organization is in the area of safety. This culture of safety has each person on the job involved in making that job site a safer one for all. It is truly a "culture of caring" that focuses on people versus just the numbers, encouragement versus enforcement, and relationships between safety personnel and the field staff versus just visibility of the staff on site. Fay's people and their safety record were acknowledged with Fay winning the AGC of America's Willis 2014 Safety Award.

Another example of Les's influence in leadership is instilling a philosophy of "believe it and you will see it"; a sense of realistic optimism that has everyone reaching for an ever raising higher bar and in turn, creation of higher value of our company. This has led to

a change in the culture of our company where each individual aspires to continually grow and develop aspiring to loftier goals.

Another result is that in early spring of 2013, Fay won national recognition for its Fort Steuben Bridge Project. Les's spreading philosophy of elevating our company's achievements on par with those of much larger companies, allowed us not only to believe in ourselves enough to enter the AGC's (the Associated General Contractors of America) 2013 Alliant Build America Award for Highway and Transportation, but to ultimately win it.

Another integral part of i+iconUSA's strategy in building value was the acquisition of a heavy/civil constructor, Waterfront Marine Construction, in Virginia Beach, VA who specializes in bridge structures, marine construction and piling/deep foundations. The biggest obstacle, and in fact a surprise, in our expansion by acquisition has been finding companies, such as Waterfront Marine, which exemplify a similar culture and set of core values that we must maintain to be synergistic with our company's vision. Our acquisition targets must have synergistic attributes to complement and add to our breadth, in either an additional construction competency or in a new geography. In the case of Waterfront Marine, both were added along with complementing core values that have been proven through a smooth integration along with the largest award in the company's history; the \$80 million MLK Expressway in Portsmouth, VA which is part of the P3 project for Norfolk's new Mid-town Tunnel.

Rounding out our strategic expansion is the creation of the newest subsidiary, i+iconENERGY, which focuses on power generation and industrial projects. i+iconENERGY is an organically driven effort, led and staffed by personnel with demonstrated past success in delivery of power plant and industrial contracts. These past relationships with clients, engineers and sub-contractors are allowing us to overcome challenges to build a business from the ground floor.

The common thread that has lead to both successes in integration of acquisitions, as well as in growing organically, is Talent Development. i+iconUSA identifies, invests in, and nurtures potential, while rewarding entrepreneurship. Talent is developed by fostering participation in a more encompassing and ever expanding vision for the company.

Developing talent at all levels is what makes i+iconUSA and its subsidiaries a great company!

i+iconUSA's goal is to continue expansion both through further organic means and culturally matching acquisitions. To fuel growth, financial backing is necessary. For i+iconUSA, that financial backing is provided through its investment partner FdG Associates (FdG). They provide the capital to foster expansion, development and make appropriate acquisitions.

i+iconUSA looks to fulfilling its founding vision of expanding into a

nationally recognized, exemplary firm within the construction industry by inspiring an entrepreneurial spirit in its most important asset; its people.

About the Authors...



Charleroi Monessen Bridge Before and After

Property of i+iconUSA.

Lester (Les) C. Snyder III is the President and Chief Executive Officer for Infrastructure and Industrial Constructors USA, LLC (i+iconUSA), which serves as the parent for a family of diversified heavy/civil and industrial construction companies. Prior to his current position, Les was President and Chief Operating Officer for a design and construction services company operating throughout the United States, in Mexico and Canada averaging over \$1.2 billion in annual revenues.

Les is actively involved in the Associated General Contractors of America (AGCA), where his service has earned him the status of Life Director on AGCA's Board. He currently serves as the chair of the Public-Private Partnership (P3) Task Force and is a past

chair of the joint AIA-AGC Committee. He is a past Chairman of the Building Division and multiple other committees including the Private/Public Industry Advisory Council (PIAC). Additionally, he is active with the Construction Industry Round Table (CIRT) and continues his membership with the Engineers' Society of Western PA (ESWP), the National Society of Professional Engineers (NSPE) and American Society of Highway Engineers (ASHE).

Katie Spear is the Marketing Director of Infrastructure and Industrial Constructors USA, LLC (i+iconUSA), having been there since its inception. She has over 25 years of marketing experience including strategic planning, bid proposals, and social media. Katie is a member of Engineers' Society of Western PA (ESWP).

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