

PHASE III

COMMERCIALIZATION™

WINTER 2009

THE NEW RACE INTO SPACE

Funding
ALTERNATIVE
ENERGY
by State

NIH RAID
on the Valley of Death

THE TRANSFORMATIONAL
ENTREPRENEUR



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EDITOR'S NOTE

In the Small Business Innovation Research (SBIR) community, commercialization is also referred to as Phase III. The *Phase III Commercialization™* magazine is dedicated to exploring the many aspects of the commercialization process utilized by small businesses that work with civilian and mission agencies. Our approach cuts across disciplines and industries and focuses on four broadly defined content areas – medical, energy, defense and space exploration. In every issue, we also highlight commercialization strategies utilized and challenges faced by small, advanced technology firms.

This is the first issue in which we have had included space exploration as a focal point. In the medical, energy and defense articles we discuss different sources of funding available to companies pursuing continued technology maturation. The challenges associated with growing an advanced technology firm, adding a sales force, and preparing to manufacture new products are also highlighted.

We hope you enjoy this publication. Our goal is to provide insight and information to those who are intent on being successful in commercializing, transitioning or infusing their technologies into the marketplace. Please feel free to send us suggestions for future articles you would find of interest.



Sincerely,

A stylized, handwritten signature in white ink that reads "Jenny C. Servo". The signature is fluid and cursive, with the first and last names being more prominent.

Jenny C. Servo, Ph.D.
President, Dawnbreaker, Inc.
The Commercialization Company

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Currently a managing director of investment banking for the McLean Group, Lebischak's impressive career began as a commissioned officer with the U.S. Coast Guard, followed by management positions with defense and aerospace contractors such as Lockheed Martin, Boeing and Northrop Grumman. Lebischak is an NSF SBIR reviewer, a charter member of the Kauffman Foundation Innovation Accelerator and vice-chairman of the MIT Enterprise Forum. He holds an MBA from Wharton, a Master's in Management and Engineering from Penn State and a B.S. from the U.S. Coast Guard Academy.



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Co-author of *Every Business Needs an Angel*, May is the managing partner of New Vantage Group, a Virginia-based firm that mobilizes private equity capital into early-stage companies. He administers four regional angel groups, including the Dinner Club, and has joint ventures with several other angel networks. May also serves as investment director and general partner in London-based Seraphim Capital and is the managing general partner of two U.S. venture capital funds.



Dennis Thompson

Dennis Thompson serves as the executive director of the Doyle Center for Manufacturing Technology. For more than 30 years, he has held positions at Chrysler, Stanadyne, Advanced Drainage Systems, Remington Arms and Catalyst Connection. Thompson holds an M.S. in business management from Rensselaer Polytechnic Institute at the Hartford Graduate Center.



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Todd Farrar has provided commercialization assistance and market analysis to more than 300 SBIR funded clients and has tailored specific services to assist a broad range of Fortune 500 companies, universities and government agencies. Farrar is a business acceleration manager at Dawnbreaker, where he consults with clients in the aerospace and defense arenas. He has a B.S. in Computer Science from Ithaca College and an MBA from Rochester Institute of Technology.



Jenny C. Servo, Ph.D.

The founder of Dawnbreaker, Jenny Servo specializes in designing government agency programs and assisting small, advanced technology firms with organizational development, market research and business and strategic planning. A frequent SBIR conference speaker, she has also written extensively on innovation and is the senior author of the books *Business Planning for Scientists and Engineers*, *Knock Their Socks Off: Making Winning Presentations to Investors* and *Indicators of Commercial Potential*. Servo holds an M.S. from the University of Kansas and a Ph.D. from the University of Rochester.



Robert F. Larsen

Bob Larsen, a manufacturing consultant and skilled negotiator at Dawnbreaker, is focused mainly on manufacturing assessments and assisting small businesses in the sale of lines of business. Larsen has spent 25 years directing the growth of domestic and international original equipment manufacturing and service businesses, including serving as a vice president for multiple divisions of Lockheed Martin. His B.S. in business is from New York Institute of Technology.



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When joining Dawnbreaker in 2008, Rich Smerbeck had 25 years of R&D experience in the pharmaceutical and medical device industries. Throughout his career, he has played key roles in the development and launch of more than 50 products, including pharmaceuticals and nutritional supplements, and he is listed as an inventor on 25 patents. Smerbeck has served in positions at Warner Lambert, Schering Plough, and Bausch and Lomb, where he was vice president of global pharmaceutical R&D.



Terry M. McMahon, MBA

Terry McMahon, a Dawnbreaker business acceleration manager, has an extensive background in marketing, product development and both business and strategic planning. During his nearly 40 year career, he has, among many other things, served as a marketing director for an Eastman Kodak venture company and led business development efforts for a \$190 million global parts and service business. McMahon holds an associate degree in electrical technology, a B.S. in business management and an MBA in finance.



Julie A. Smith

Julie Smith has spent her 20 year career working in communications, fundraising and public relations for both public and private sector organizations, including a major research university and a Fortune 250 company. At Dawnbreaker, Smith is a senior analyst where she serves as a writer and editor for numerous Navy, Department of Energy and small business client projects and publications. She holds a B.A. in political science from Indiana University.



Ian A. Roth, MBA

Ian Roth has 15 years of manufacturing, project management and engineering experience in glass manufacturing and e-learning. Roth's skill set ranges from advanced materials research to customer management. At Dawnbreaker, Roth is a business acceleration manager for NASA and other clients, providing commercialization assistance to advanced technology firms. He has a B.S. in ceramic engineering from Alfred University and a MBA from the University of Rochester.



Alexander D. Stoyen, Ph.D.

Alex Stoyen, who joined Dawnbreaker in 2007, is the founder of 21st Century Systems, where he also served as chairman and CEO at the award-winning company. In his career, he has written extensively and contributed to key technological concepts in information systems at distinguished institutions such as the University of Nebraska's Peter Kiewit Institute and the IBM Zurich Research Laboratory. Stoyen's Ph.D. in Computer Science is from the University of Toronto.



THE HIGH COST OF



by Robert F. Larsen

LOW QUALITY

Oversight of Quality Issues Will Impact the Bottom Line

THE BUSINESS MODEL OF CHOICE

For some small businesses is to become a manufacturer. Once a company decides to become a manufacturer, the team must understand the level of commitment that is required to assure that the company becomes a quality supplier. As a new manufacturer, the firm needs to plan for and implement quality control measures for every step of the manufacturing process. The firm which invests the time and processes that enhance the detection and prevention of poor quality products will find its investment offset by the reduction in product failures.

Defining Quality

To begin to understand the cost of poor quality (COPQ), it must first be defined and then taken very seriously. In a typical situation, the cost of quality can be identified as one of four components:

1 External Failure Cost:

The defects found after the customer receives the product or service. This cost drives processing customer complaints, customer returns, warranty claims, product recalls and potential lawsuits.

2 Internal Failure Cost:

The defects found before the customer receives the product or service. This cost drives scrap, rework, re-inspection, re-testing, material review, potentially additional material and the cost of material procurement.

3 Inspection Cost:

This is the cost to determine the degree of conformance to quality require-

ments, measuring, evaluating and or auditing. This drives the cost of inspection, testing, process or service audits, calibration of measuring and test equipment.

4 Prevention Cost:

This is the cost to prevent poor quality. This cost drives new product review, quality planning, supplier surveys, process reviews, quality improvement teams, education and training.

Poor quality cost can be measured in a number of terms including, scrap, rework, returns, customer complaints, compromised service levels, customer losses, recalls and lawsuits. The costs associated with poor quality can range from 15 to 40 percent (20 percent being the average) of total business cost, so no matter the definition, the cost of poor quality can make or break a company. Reducing or completely eliminating quality costs starts with designing in quality at the very beginning.

Building a Quality Foundation

So what are the elementary steps a new manufacturer must take when beginning the process of manufacturing a product? First, it must be designed to meet and exceed performance requirements. A high quality design must consider material selection based on specifications and reliability, as well as the tolerances to ensure manufacturing repeatability (the ability to reliably manufacture a product in quantity). As the design develops, prototypes are tested and evaluated for performance, with changes being considered to achieve the necessary requirements.

When the design is completed and thoroughly tested, it is ready to transition into production, but before that can happen, production operations, tooling and inspection points must be decided and documented in order to optimize product performance and meet design specifications. With the process mapped ahead of time, it is much more likely that products that do not meet the specifications will be caught before they reach the customer's hands. The earlier a quality problem is detected and remedied, the less it will cost.

Realistic COPQ


Independent studies reveal that COPQ is costing companies millions of dollars each year and its reduction can transform marginally successful companies into profitable ones. While most executives believe that their company's COPQ is less than 5 percent, businesses need to recognize that quality is an absolute necessity to survive and succeed in business.

To see what the actual implications of COPQ are, picture this – a manufacturing company with annual sales of \$250 million calculated the total cost of repair, rework, scrap, service calls, warranty claims and write-offs from obsolete finished goods. Their COPQ was 20 percent of their annual sales, which implied that one day of each five-day workweek, the entire company essentially made scrap, representing a loss of nearly \$100,000 per day.

Corrective Actions

To systematically reduce COPQ, businesses need to institute corrective and preventative actions (CAPA) to remedy problems as soon as they are detected. The root cause needs to be investigated and CAPA items created for approval and implementation. Actions may include, among other things, amendments to procedures, a recalibration in manufacturing equipment, examination of supplier specifications, or training an employee to improve skill sets.

There are several "lean manufacturing" techniques/systems that can be employed by manufacturers to assist with reducing waste and improving quality. Value stream mapping, which was discussed in an earlier issue of this publication, is one of the tools that can be utilized in lean manufacturing. Six Sigma is another highly regarded system for manufacturers to consider – companies that implement six sigma have been reported to have reduced their COPQ to as low as 1 percent of sales. Whichever system is utilized, information needs to flow out of the CAPA process quickly and accurately without missteps. This will save the company money down the line. ■

 We will examine quality issues and corrective actions in greater detail in future articles of Phase III Commercialization magazine.



THE NEW RACE INTO SPACE

NEXT STEPS AND THE IMPLICATIONS FOR U.S. AEROSPACE FIRMS

Since the dawn of time, man has looked to the stars and wondered, but by 1957 technology had matured to the point that the Soviets were able to launch Sputnik into orbit, breaking the barrier between man and space. Because the U.S. and the USSR were locked in a cold war battle at the time, the U.S. was primed to make the next move. Winning the race to the moon and being the first country to plant a flag would be a symbolic battle victory for the United States. This set the stage for President Kennedy's call for the U.S. to go the Moon.

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WE CHOOSE TO GO TO THE MOON IN THIS DECADE AND DO THE OTHER THINGS, NOT BECAUSE THEY ARE EASY, BUT BECAUSE THEY ARE HARD, BECAUSE THAT GOAL WILL SERVE TO ORGANIZE AND MEASURE THE BEST OF OUR ENERGIES AND SKILLS, BECAUSE THAT CHALLENGE IS ONE THAT WE ARE WILLING TO ACCEPT, ONE WE ARE UNWILLING TO POSTPONE, AND ONE WHICH WE INTEND TO WIN, AND THE OTHERS, TOO.

”

—JOHN F. KENNEDY, RICE UNIVERSITY, SEPTEMBER 12, 1962

by Todd J. Farrar and Ian A. Roth

By focusing on a manned-mission to the moon, President Kennedy unleashed a contagious energy that swept the country. Between 1962 and 1969 technological innovation and rapid scientific advancements were spurred forth by the cooperative work of universities, businesses and government agencies. Besides the obvious success of the Apollo missions, 40 years later many of the technological developments for Apollo are still useful in a variety of industries and economic sectors.

THE MOON – REDUX

As the cold war ended and the world order shifted, NASA became more collaboratively focused with the space shuttle and the international space station. Then in 2004, more than three decades following Neil Armstrong's small step, President George W. Bush announced another shift in the long-term focus for NASA. The focus was turned back to sending humans to the Moon, and eventually to Mars.

Unlike Kennedy in the '60s, Bush's choice to go to the Moon and to Mars was not for a "victory" but rather a mission to promote cooperation amongst nations. In the speech announcing the new focus for NASA, he said, "We'll invite other nations to share the challenges and opportunities of this new era of discovery ... The vision I've outlined today is a journey, not a race, and I call on other nations to join us on this journey, in the spirit of cooperation and friendship."

NEW TEAMS IN THE RACE

While cooperation may have been President Bush's initial goal, it seems as though the more recent developments within the Chinese, Japanese, Indian and Russian space programs indicate a new competition heating up, with the Moon as the near-term playing field. Though it is not charged with the geopolitical angst of the '60s, a new space race appears to be underway, with the first round of probes and orbiters wrapping up and the second round – manned missions – in the initial planning stages.

Japan, China and India all successfully launched orbiters and probes to the moon between September 2007 and October 2008. The U.S. followed suit in June 2009, with the launch of the LRO/LCROSS payloads, which impacted the lunar surface on Oct. 9. This was followed by the Nov. 13th announcement that preliminary data detected the presence of water on the moon, information critical to further missions.

THE INITIAL U.S. GAME PLAN FOR ROUND TWO

Based on a 2008 article from *Popular Science*, Russia, China and the U.S. had plans to return man to the moon no more than five years apart from each other – the U.S. in 2020, China in 2021 and Russia in 2025. But with the retirement of the Space Shuttle scheduled for 2010, what was NASA's plan for getting the U.S. to the moon? What would be the "dart" of choice that would allow the U.S. to compete in the second round of competition? The answer was in the NASA Authorization Act of 2005 which gave genesis to the Constellation Program, a human spaceflight program designed to replace the Space Shuttle and

return to the moon no later than 2020. This program planned for manned lunar missions that would allow humans to stay and build a lunar outpost, eventually enabling people to live and work on the moon's surface. The more long-term goal saw the lunar mission as a stepping-stone to Mars and beyond.

Through NASA's efforts, a mere four years later, in August 2009, the final segments of the Ares I-X rocket were stacked on a mobile launcher platform, completing the 327-foot launch vehicle. The Ares I-X completed its first test launch on Oct. 28, reaching a suborbital altitude of 150,000 feet.

AUGUSTINE PANEL

Unfortunately for NASA, the current economic crisis has prompted major shifts in federal budget priorities. It was reported in an Aug. 13, 2009 edition of the *Orlando Sentinel* that a recent presidential panel, called the Augustine Panel, believed that NASA's annual budget of about \$18 billion would pay to keep astronauts flying – albeit aboard Russian rockets – to the space station through 2020. However, there would be no money for travel to the Moon, Mars or for exploring other parts of the solar system for at least twenty years.

"We haven't found a scenario that includes exploration that's viable," said former astronaut Sally Ride, a member of the Augustine Panel.

With the Shuttle retirement quickly approaching and the Ares I rocket with a questionable 2015 launch date, what will the U.S. do in the meantime? Interestingly enough, in the same *Orlando Sentinel* article referenced earlier, Ride said, "If there was one winner [from the meeting on] Wednesday, it was commercial space companies, which the panel said should take cargo, crew and possibly rocket fuel and fuel tanks into orbit." Ride urged \$200 million more to further develop fledgling cargo capabilities and \$2.5 billion for competitive programs that would help private companies develop capsules to ferry astronauts to the space station.

The initial Augustine Panel findings contained five manned options for ferrying astronauts and cargo once the space shuttle retires. One option was that commercial services could deliver crew to low-Earth orbit (LEO). The panel wrote, "While this presents some risk, it could provide an earlier capability at lower initial and lifecycle costs than government could achieve. A new competition with adequate incentives should be open to all U.S. aerospace companies. This would allow NASA to focus on more challenging roles, including human exploration beyond low-Earth orbit, based on the continued development of the current or modified Orion spacecraft."

COMMERCIAL AEROSPACE OPPORTUNITIES

Leading aerospace companies seem to agree. An Aug. 28 *Wall Street Journal* article reported that the "scale and nature of sending this type of work to private contractors, unheard of in the history of the National Aeronautics and Space Administration, could help the administration cope with an increasingly dire budget situation and fill crucial gaps in its program." In the article, Lawrence H. Williams, vice president for strategic re-

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IN FLORIDA.”

A new competition
is heating up, with
the moon as the near
term playing field.

lations for Space Exploration Technologies Corp. (SpaceX), discussed the potential for their company and other commercial aerospace entities going forward. "At the end of the day," said Williams, "a commercial approach requires industry to share the development investment risk, but also permits greater rewards by selling the technology to other customers. It's a much more free-market approach."

Williams, whose company is planning for a 2010 launch of its Falcon 9 heavy-lift rocket, has also said that he believes

ton, PA provides comprehensive training and research support for government and commercial space programs, as well as military and civilian aircrews. Companies such as NASTAR provide critical support services. So far nearly 200 people, including Sir Richard Branson, have completed space training at the NASTAR Center. As limited knowledge exists on how the 'general public' will fare at 6 G's of force (6 times your body weight), research has also been collected on space flight participants.

The Augustine Panel is a presidential panel convened to assess U.S. manned space flight.



LRO/LCROSS Launches on an Atlas V rocket, June 18, 2009. (NASA/Tom Farrar, Kevin O'Connell)

NASA's acquisition of U.S. commercial crew and cargo services will lead to expansive new opportunities in space, likely leading to the creation of an entirely new industry in LEO. "It's difficult to know at this stage, but low-Earth orbit could turn out to be the next Internet in terms of opening up opportunities for commerce that previously never existed." His vision of the future carries the endorsement of Sally Ride who recently said, "We'd like to get NASA out of the business of flying people to and from LEO."

What this will mean for smaller players and start-ups in the aerospace industry, time will tell. It does appear though that small firms will have some opportunity to compete for the new business. According to the previously referenced *Wall Street Journal* article, smaller firms that are, "contract winners would use corporate funds to build and test rockets, provide compatible space capsules and then try to recoup those investments by offering commercial-style transportation services to the agency. Essentially, NASA would be paying a set fee for every pound or person transported to orbit. As to how commercial aerospace can impact the bottom line, SpaceX CEO, Elon Musk, has said that, "Within a few years we could send astronauts to space for about \$20 million a person, less than the \$50 million Russia is charging."

SERVICES AND TRAINING

Commercial companies are also primed to provide the required support services such as training. For instance, an Environmental Tectonics Corporation subsidiary, the National Aerospace Training and Research (NASTAR) Center of Southamp-

ton, PA provides comprehensive training and research support for government and commercial space programs, as well as military and civilian aircrews. Companies such as NASTAR provide critical support services. So far nearly 200 people, including Sir Richard Branson, have completed space training at the NASTAR Center. As limited knowledge exists on how the 'general public' will fare at 6 G's of force (6 times your body weight), research has also been collected on space flight participants.

WHAT'S NEXT?

So, what now? The Augustine Panel delivered its final report to the President on Oct. 22 and until decisions are made NASA is in limbo, with the worst-case scenario being that lunar missions are scrapped for decades. One alternative proposed is canceling the Ares I rocket and its LEO missions in favor of more challenging missions.

What is known is that in America's latest space race, a new breed of scrappy entrepreneurs could have the opportunity to mold the future of the aerospace industry. ■■■

A commercial approach requires industry to share the development investment risk, but also permits greater rewards by selling the technology to other customers.

The Transformational Entrepreneur

by Jenny C. Servo

GROWING A COMPANY and maturing a technology requires more than money, more than technology expertise. Growth requires the ability of company founders to embrace the challenge of personal change. Companies are ultimately a reflection of the founder; a mirror that accentuates both the strengths and weaknesses of the individual and/or team. For new entrepreneurs I hope this article will provide insight into the challenges that lay before you. For seasoned entrepreneurs there is often comfort in knowing that others have faced the same challenges and situations.

The term *transformational entrepreneur* is one which I use to describe the type of founder who can continually re-evaluate the situation, change their roles, and modify their perspective as critical situations arise. It is such individuals whose companies grow; whose companies become the gazelles of the future.

Companies start in different ways—out of necessity, out of frustration, out of the promise of a new opportunity. The founder typically has a great capacity for work. Numerous studies have shown that entrepreneurs often need less sleep than most, which is beneficial given the amount of work that lay before them. Founders are driven and provide an inordinate amount of time to their work and their vision. They invest *sweat equity*, a euphemism for investing time without pay. Many times other family members – whether a spouse, sibling, parent, or child – will also commit their time and energy to the company. The involvement of family members is often essential to the success of the start-up, as only a limited number of people will invest their time on speculation. The first couple of years are tenuous, with the founders rarely drawing a regu-

lar salary. This situation provides plenty of challenges – but the true challenge comes when you have to stop doing business in this fashion.

What often precipitates a change is a response from your customers – this may be either an opportunistic event, or a response to the marketing that you have carefully orchestrated. With SBIR funded firms, such marketing may consist of frequent proposal writing, frequent visits to program managers, discussions with topic authors, development of capabilities statements, and conference participation.

Expanding Your Staff

In response to your marketing efforts, at some point your firm receives a big order. For various reasons it is no longer feasible for you to use the approaches of the past – i.e. consultants or part-time staff. You have to hire new, full-time personnel. You are in essence hiring the first generation of full-time employees, post founders. The people that you need to hire are experienced; they benchmark their salary and benefits expectations against what they have been earning in

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mature, established industries. Their motivation for joining your company is not the same as yours – they want a good 40 hour per week job with a good salary. Imagine that at this point, you and your co-founders may still not be drawing a regular salary – yet you need to provide this level of stability to the next generation of employees – to employees who have not experienced the start-up phase with you; who have not sacrificed, as you have.

Some founders can't make this leap. They decide that the responsibility of more full-time staff is something that they are reluctant to handle. They can't see their way clear to be financially responsible on an ongoing basis. They don't want to worry about personnel issues. They don't want to pay others a full-time salary when they are not yet receiving a regular salary themselves. The transformational entrepreneur by contrast, after considering the vision of the company; after considering where they are in the growth cycle; after evaluating the stage of their relationship with potential customers, takes that leap and jumps into new territory – trusting that they will be able to provide for a growing business. The challenges of expanding staff are significant.

From a compliance perspective – you have to understand more about labor laws; about the differences between at-will employment and contract. You may have to redefine and expand your pay structure, develop job descriptions, think about career paths for the new staff that you are adding to your company.

Perhaps the most difficult thing to accomplish is blending the two generations of employees – the founders and the next generation. New employees bring with them a perspective related to their employment experience. They come knowing very little about your firm, but they want to contribute. If they don't quickly see your company's direction, they will confuse their lack of knowledge with your lack of planning and forethought.

Therefore, as you add new staff – you must have a method of sharing your vision; sharing your corporate history, and integrating new employees into the fabric of what you are doing now and how it relates to the future you are building together. Regular company meetings is one way of doing this with the goal of showing your team the relationship between what they are doing and where you are going. A personal challenge for founders is to embrace new employees, to integrate them into the plans for the future and do all that you can to avoid a "them and us" culture. Expect that there will be growing pains, that there will be conflicts, that you will make mistakes in hiring, that you will need to let some people go.

As your company grows and you become more sophisticated with finance and with understanding the issues related to contract law, there will come a time when your rates are finally at the appropriate level for growth. The founders need to again change their perspective – recognizing that they are not poor any more. Now, you have the resources to do things that were not possible in the past – purchase new equipment; move into a larger facility; upgrade the office furniture; provide your staff with critical training; and hire more support. These are things that need to be done, but often times a founder is so accustomed to doing without that it's difficult to recognize that there have been drastic changes that sweep you up to the next level of growth.

Delegation

As you grow your company and add staff, many worries seem to dissipate – you no longer fret about providing for so many – you don't have time to worry, you just do it. Although your company has grown, your organizational structure may not have evolved. You may find yourself with too many direct reports and feel that every employee is a weight that pulls on you. Even though it's obvious that the answer lies in delegation and reorganization – this is not easily done. To make an effective transition, soul searching by key members of the team is a prerequisite.

At the core of any growing enterprise are a handful of people who give themselves over completely to making the company a success. If you are growing the company well – that core will expand over time, you will have very little turn over, and key employees will internalize the vision of the firm. Instead of being your company, it will become their company.

Although the core of dedicated people will grow, the founder is still the one that provides the time, energy and direction. You're still the leader of the band. Therefore, in redesigning or remaking a firm to deal with the issue of growth – that core group or key individual must ask themselves what makes them happy. Would the founder be happy just managing? The answer is usually no. Will the founder be happy only if they are doing R&D? What about doing R&D part time? Will they be happier retiring? Will they need to bring in another manager? Where is the balance and what are the implications?

The senior people in an entrepreneurial firm have shared experiences; have established relationships with customers and with one another; although they may not truly appreciate what makes the company work, they have substantial corporate history to draw upon. How do you clone that expertise? How do you develop the trust and confidence in someone new? In many advanced technology firms, the learning curve

Bit by bit you delegate, dropping away those aspects of your role that you have decided to relinquish. You lop off parts of what you used to do and have it become part of another person's job...

is steep and it may take at least a year to train a new person. During that time you lean heavily on your senior people and the exhaustion continues to mount, for you and for them. You try to screen well; you try to train as best you can; you look for initiative; you look for those who seem to share your vision and who treat customers in the same way.

Bit by bit you delegate, dropping away those aspects of your role that you have decided to relinquish. You lop off parts of what you used to do and have it become part of another person's job – perhaps program management, perhaps proposal writing, perhaps paying the bills, perhaps certain types of R&D. You stand on the sidelines and watch. If they drop the ball – you catch it. You catch it, because it's your baby and you care. Over time, new, strong employees will emerge and opportunities to delegate will be realized.

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At the core of any growing enterprise are a handful of people who give themselves over completely to making the company a success.

As your rate of growth continues to escalate, as the opportunities continue to present themselves, the only way to meet the demand may be to partner with others or to seek investment to fuel growth.

Every time you thoroughly train a new person and put them in a managerial role, you buy yourself time...

Taking Care of Your Team

You watch your team; you look for signs that they are doing too much; you tell them to take time off; you celebrate their successes, you weep with the tragedies that befall them. You are patient with those that try and have no sympathy for those whose personal agendas would destroy the fabric of what you have built.

Through all of this, there needs to be an undercurrent of letting go. Even grieving, if you wish – because you must prepare others to tend to your baby. The company cannot grow if you cling to it too tightly.

Growth comes from “leaps of faith” and trust – but wise, observant and considered trust. Increases must be earned and not “awarded.” Letting go becomes easier, as the capabilities of others grow and as you continually define your role.

Taking Care of Customers

Remember, if you don't take care of your customers, your competitors will. Now, with a stronger organization in place, with individuals who you can rely on to do the tasks you have delegated, you increasingly turn to your customers. You are on the road, visiting first with existing customers and secondarily with new ones. You are on the road again, and again...

Taking Care of Yourself

Your plate is full – you are steering the company down a path, trying to meet your obligations while maintaining quality as you expand. Still working far too many hours.... But as your company becomes more robust and is recognized as an established entity, distractions will abound. Distractions come from everywhere like a sudden burst of rain. New opportunities

that don't fit with your mission arise every week. You find yourself saying “No” a lot – trying to dodge the rain drops. You listen to your inner voice for guidance, you watch for opportunities but don't veer too quickly, you learn to separate the wheat from the chaff; you learn to maintain your energy and remain focused on the task at hand.

Personal energy is a limited commodity. There's only so much to give. Sometimes you will expend so much of your personal energy that you will feel like walking away from it all. In terms of the road traveled, you spent days at the outset, working exorbitant hours because you were resource-less. This was followed by years of working exorbitant hours due to growth. For although growth brings more human resources to your company, until you have enough good managers in place, the demands on your time remain high. So when you are really tired, take a break. Leave for the day, take a long week-end, go on a retreat, go on a vacation, restore yourself. When you feel like chucking it all – remember this is transient and the result of exhaustion.

Partnering

It may seem surprising that I haven't mentioned financial challenges – the contract lost; the botched job, the technology that fails. Neither have I spoken about the challenges associated with adding new business functions such as manufacturing, marketing and sales, or with commercializing. Those challenges are significant and require the same kind of diligence by the founders. I omit those challenges from this discussion only for fear of making this article too hard to follow. But let me begin to address the latter in the following way. As your rate of growth continues to escalate, as the opportunities continue to present themselves, the only way to meet the demand may be to partner with others or to seek investment to fuel growth.

Finding a business partner has much in common with marriage. In this culture arranged marriages are rare, as is our tendency to jump into marriage after the first date. Yet finding an investor and/or partner is often approached in one of these two ways. Perhaps it's naiveté, perhaps it's the urgency of the moment – but rushing to the altar with a partner or investor is not the ideal way to develop a lasting relationship. It's far better to live in each others space for a period of time – be a subcontractor to a potential partner or have them as a subcontractor to you. Collaborate on R&D partnerships. Learn more about them from the inside before you make this profound step.

Letting Go

There are two sides to letting go, personal confidence (a prerequisite for becoming a transformational entrepreneur) and knowing that there are others you can rely on. In order to let go, in order to be a transformational entrepreneur, you must first feel confident in your ability to carve out another future – otherwise, you will be unable to let go of this one. Like a good parent who nurtures strong, independent children who can stand on their own, your job as a transformational entrepreneur is to nurture a firm that can continue with your reduced involvement. You then have the delight of selecting your next great adventure. ■■■



1. GOOD RESEARCH
2. GOOD DECISIONS
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Staring Into the Valley of Death?

NIH RAID to the Rescue

THE “VALLEY OF DEATH” is a familiar phrase amongst many small R&D firms. It describes the time during product development when a project has progressed far enough along so that investment money is required to move it ahead. Unfortunately, as is often the case, potential investors, partners and large companies feel that the project is too early in development to risk investment.

by Richard V. Smerbeck

IN THE CASE OF A START-UP drug/biologic business, the valley of death is typically encountered during the pre-clinical stage of development. In the preclinical stage, data to support the safe testing of a drug or biologic in humans is collected. Without such data, a company cannot file their Investigational New Drug (IND) application, get approval from FDA and start clinical testing. Most potential investors in small pharmaceutical businesses consider the risk too great to consider investing until the company has a fileable IND.

The cost of developing a drug or biologic is formidable. It's not unusual to spend \$20 million or more to bring a new chemical entity (NCE) through the preclinical phase of drug development. This level of funding is beyond the means of most small pharmaceutical companies. With investment funding in short supply, many promising therapies do not make it from the bench to the clinical trials. To mitigate the funding shortfalls available privately, the National Institutes of Health (NIH) established the Rapid Access to Interventional Development (RAID) program as a part of the most current NIH Roadmap for Medical Research.

RAID Services

In the RAID program, the NIH makes its own preclinical drug development resources available to individuals, academic re-

searchers and small businesses. If accepted into the RAID program, these services are free of charge to the grantee.

The NIH RAID program will provide some or all of the services listed on the following page to the grantee. The program also provides the project management and quality resources to ensure that the Good Laboratory Practices and Good Manufacturing Practices are followed – making the results suitable for inclusion in the IND application.

The cost of developing a drug or biologic is formidable. It's not unusual to spend \$20M or more to bring a new chemical entity (NCE) through the pre-clinical phase of drug development.

RAID Application Process

The RAID program, while open to all qualified applicants, does have a thorough selection process. According to Dr. David Badman, NIH RAID Program Coordinator, an applicant will need a compound or biologic that is “druggable.” That is, the compound has to have the characteristics that will allow it be evaluated and ultimately approved by the FDA as a drug. Some examples of druggable characteristics include single molecular entity, known synthetic route and/or administered via pharmaceu-

tically accepted means. A clear intellectual property strategy should be in place – the applicant must have the right to develop the molecule. Strong animal efficacy data should also be in hand. Dr. Badman suggests that the study and results should be of “peer-reviewed publication quality.”

Once a potential applicant reaches that point, the RAID staff urges the applicant to contact the RAID representative from the appropriate Institute within NIH to determine if the project is potentially supportable.

For the Institute or Center to support the RAID program an application process must be completed. Details of the application process can be found at: grants.nih.gov/grants/guide/pa-files/PAR-09-027.html.

The scientific merit of an application is determined by a Special Emphasis Panel (SEP) formed by NIH's Center for Scientific Review.

If the SEP determines that a program has sufficient scientific and technical merit, then the relevant Institute or Center has the option to recommend that the applicant be invited to present the program at a meeting at the NIH. At that meeting, an agreement will be reached as to what services are needed. These services are costed out by NIH staff. ■■■



See page 14 for a list of RAID contacts and specific services available. ►►

NIH Institute RAID Contacts

National Cancer Institute (NCI)

Richard Camalier
camalier@mail.nih.gov

National Heart, Lung and Blood Institute (NHLBI)

Heath Mondoro, Ph.D.
mondorot@nhlbi.nih.gov

National Institute on Aging (NIA)

Chhandra Dutta, Ph.D.
duttac@nia.nih.gov

National Institute on Alcohol Abuse and Alcoholism (NIAAA)

Nanwei Cao, Ph.D.
caon@helix.nih.gov

National Institute of Allergy and Infectious Diseases (NIAID)

Beth Spinelli
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National Institute of Arthritis, Musculoskeletal and Skin Disease (NIAMS)

Gayle Lester, Ph.D.
lester1@mail.nih.gov

National Institute of Child Health and Human Development (NICHD)

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National Institute on Drug Abuse (NIDA)

David McCann, Ph.D.
dmccann@nih.gov

National Institute on Deafness and Other Communication (NIDCD)

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National Institutes of Dental and Craniofacial Research (NIDCR)

Dwayne Lunsford, Ph.D.
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National Institute of Diabetes, Digestive and Kidney Diseases (NIDDK)

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National Institute of Environmental Health Sciences (NIEHS)

Dennis Lang, Ph.D.
DL73v@nih.gov

National Institute of Mental Health (NIMH)

Jamie Driscoll
jdriscoll@mail.nih.gov

National Institute of Neurological Disorders (NINDS)

Lydia Munger-Little
Lydia.MungerLittle@nih.gov

Guidelines for RAID Funding

NIH Application Tips

- ▶ A registration process is necessary before submission and applicants are highly encouraged to start the process at least four (4) weeks prior to the grant submission date.
- ▶ Applications must be submitted electronically through Grants.gov (www.grants.gov) using the SF424 Research and Related (R&R) forms and the SF424 (R&R) Application Guide. Applications may not be submitted in paper format.
- ▶ The FOA must be read in conjunction with the application guidelines included with the announcement in Grants.gov/Apply for Grants.

Critical Upcoming Dates for NIH RAID Application

	Letter of Intent Deadline	Application Deadline	The NIH RAID program currently accepts applications three times a year. The scheduled critical upcoming dates for 2010 and 2011 can be found in the table to the left.
Cycle 15	April 14, 2010	May 14, 2010	
Cycle 16	August 16, 2010	September 15, 2010	
Cycle 17	December 15, 2010	January 14, 2011	
Cycle 18	April 18, 2011	May 16, 2011	
Cycle 19	August 16, 2011	September 15, 2011	

Specific RAID Services Available When a Lead Therapeutic Agent:

HAS been selected and proposed for preclinical development		
HAS NOT YET been selected and proposed for preclinical development		
Small molecule, natural product, peptide, oligonucleotides or gene vectors:		
Scale-up production		x
Synthesis	x	x
Development of analytical methods	x	x
Development of suitable formulations		x
Isolation and purification of natural products	x	x
Pharmacokinetic/ADME studies including bioanalytical method dev.	x	x
Preliminary toxicology	x	
Range-finding initial toxicology		x
IND-directed toxicology		x
Manufacture of clinical trial supplies		x
Product development planning and advice in IND preparation		x
Recombinant protein or monoclonal antibody:		
Pharmacokinetic /ADME studies including bioanalytical method dev.	x	x
Preliminary toxicology	x	
Range-finding initial toxicology		x
IND-directed toxicology		x
Product development planning and advice in IND preparation		x

Dr. David G. Badman, Program Coordinator for NIH RAID

David G. Badman, Ph.D. has had a distinguished academic and civil service career with the NIH, retiring in 2004. Since that time, he has contracted with the National Institute of Diabetes and Digestive and Kidney Diseases, where he is the program coordinator for the NIH RAID (Rapid Access to Interventional Development) program, a Roadmap program designed to assist academic investigators in developing therapeutic agents.



BUILDING

A MARKETING DATABASE:

HOW TO BUILD A DATABASE TO INCREASE SALES

by Terry M. McMahon

YOU FINALLY HAVE A PRODUCT. After many years dedicated to research and development, you have a commercial product that is ready to sell! You evaluate if you should develop your own direct sales force, use distributors or reps, or license to another firm with a complementary product line and strong marketing and distribution channels. This article will help you understand key functions of a direct marketing and sales team. ►►

SALES ARE THE LIFE-BLOOD of business. All business owners know that it takes money to make money, but small businesses especially need to make every dollar count. With limited budgets and limited time, proactive marketing is key to making the sale.

Essentially, the marketing function is a generator of information for decision-making. To properly market a product/service information must be properly vetted to yield useable data that assists the business in the following ways:



Some studies have indicated it takes an average of 7 sales calls on a new prospect before they will place a purchase order. By using the approach just described, the number of sales calls should be reduced because of the initial research and communication.

- ▶ Evaluating various market opportunities and the size and development of growth plans
- ▶ Tracking business results by market segment
- ▶ Supporting new marketing campaigns by identification of customers with similar attributes, locations, size and contact points
- ▶ Targeting customer communications and refining the lead generation process
- ▶ Providing direction and support to the sales organization of the business

With a targeted set of marketing tools in the form of a database, small businesses with products/services that could address the needs of multiple market segments or firms with a broad base of potential clients that are geographically dispersed, can expand their sales base and penetrate new markets.

Basic Elements of a Comprehensive Marketing Database

Though it may seem elementary to some, it is important to note the basic elements necessary for business opportunity expansion.

- ▶ **Internal Database** – a set of existing customers
- ▶ **External Database** – an outside service to identify new customers by geographic or market segments
- ▶ **Data Conditioning** – a method to integrate the external database with the internal database
- ▶ **Mapping Program** – technology used to bring a visual perspective to the data and relate it to the individual sales territories

The integration of these elements into a process that yields useful, actionable information creates an effective marketing database. In simple terms, this marketing database involves integrating existing customer data with an outside source of potential customer information into an electronic database that can be sliced, diced and mapped as required.

Potential Marketing Database Users

Before examining the nuts and bolts of the marketing database, it's important to discuss the information needs that can be addressed.

The typical stakeholders in the use of this database would be the individuals involved in marketing/sales for the business. In some companies, the marketing/selling functions are combined and in others, it is separated. While the primary charter of the marketing function is opportunity identification/quantification combined with finding and keeping potential customers, the primary charter of the selling function is to call on potential customers, uncover opportunities for the products represented and close on orders.

Managing sales requires the establishment and management of the selling process, which typically involves developing and maintaining a cost effective sales organization and channels to reach customers. To do that the sales manager would need a marketing database that would:

- ▶ Identify customer by size and location (county and state)
- ▶ Establish territory potential and gauge penetration rate / sales effectiveness in that territory
- ▶ Focus direct sales or indirect sales on new potential customers
- ▶ Set individual sales quotas
- ▶ Provide visual aids of customer locations relative to the sales office
- ▶ Leverage successes from one customer in one territory to similar type customers in another territory

The Essence of Finding New Business Opportunities

Subscription services are available to identify new customers and contact information by geographic areas or market segments and to scrub or enhance existing customer data. Some services available are Zapdata, infoUSA, Reference USA, Manufacturer's News, Inc. (MNI), and Industrial Info Resources (IIR).

Before the information from these subscription services is purchased, they often provide a profile report showing the number of companies for each state or county using the filters selected, which will assist small businesses in deciding whether or not the service will be a cost-effective purchase.

These services can be effective at not only providing the small business with information on new pros-

The Cost of a Business-to-Business Sales Call



With the cost of a business-to-business (B2B) sales call rising each year, companies cannot ignore the price tag associated with calling on prospects. According to Cahners Research, the average B2B sales call cost \$329 in 2001, which in 2009 money would be approximately \$500 per call. Cahner's study was based on responses from 23,341 businesses. The study also found:

5	Number of sales calls, on average, that is required to close a \$35K + business-to-business sale.
20	Percent of sales efforts focused on prospective new clients.
4.6	The average number of sales calls taken by customers over the phone per week.
2	The number of in-person meetings between sales people and customers per week.
75	Percent of companies that say making a sale valued at more than \$35K requires both direct and indirect sales efforts.

TO LOWER THE COST OF MAKING A SALE, the small business should use efficient techniques to generate leads and limit the investment in personal sales calls to cases where there is significant potential to close a sale. Marketing for leads identifies and nurtures new leads, then moves them along to a point where the cost of the sales call becomes an investment in an actual sale.

pects, but can enhance the information available for the existing customer base. By providing data to the subscription service from an internal database, the service can add additional fields of information, such as:

- ▶ SIC or NAIC codes
- ▶ Number of employees
- ▶ Sales volume
- ▶ Location Geo code
- ▶ Family tree information
- ▶ Contact information for key job titles, often including email addresses

Having a good profile for existing customers that includes proper market coding, etc. can be used for many purposes. For example, having robust customer data would allow a data sort by market segment using NAIC or SIC codes. This would enable a business to know what markets the bulk of sales is coming from, which provides insight into finding more customers of the same type. The more robust and detailed the information in the database is, the more effective and efficient it will be for the sales team.

Properly Maintaining the Database

Once the marketing database contains the information from outside services and it is ready to use, it needs to then be incorporated into the existing internal database. This will make the data available to the sales organization more robust and usable in locating potential customers.

Selecting a method to integrate existing customer data and potential customer data (data conditioning) is important. When combining internal files and purchased files it is critical that duplicate records are eliminated and that existing customers are identified differently than potential customers. This is particularly useful in mapping and for the creation of any direct mail campaign mailing lists in which existing customers should be excluded. Scrubbing of the database, as it is called, can be done manually for a few records, or electronically by the software or the subscription service. Keep in mind that the database is only as good as the data it contains. The information should be carefully maintained and updated so that its usefulness is ensured.

Database marketing in this manner is a systematic approach to the gathering, consolidation and processing of consumer data (both for customers and potential customers) maintained in a company's databases. Although databases have traditionally been used for customer data in marketing for a long time, the database marketing approach is differentiated by the fact that much more consumer data is maintained, and that the data is processed and used in new and more sophisticated ways. Among other things, marketers use the data to learn more about customers, select target markets for specific campaigns (through customer segmentation), compare customers' value to the company, and provide more specialized offerings for customers.

Building the Customer Base

Once the marketing database is prepared, it can be utilized to increase sales in many situations (though it should be noted that more established companies whose direct sales people are only assigned to select customer accounts and not free to call on other accounts may not need to utilize the tools.) Some instances that warrant the development and use of a marketing database include the hiring of a new salesperson for a growth territory. The salesperson will need to look for

prospects to call on, which a marketing database can provide. The database would also be helpful when new products are introduced with applications that match a different market segment than current products.

A robust marketing database can also be used as a motivator for a sales force in training. The salespeople have to be trained about the product, its features and applications, its advantages over competitive offerings, and the value proposition it brings supported by cost of ownership evaluation tools. Once the training is complete, salespeople are expected to go out and sell it. Sales training becomes a much more powerful and motivating experience when at the end of the training the salespeople are given a list of the potential customers, including contact and other essential information, in their designated territory.

Hammering at Cold Calls

When developing an annual territory plan the focus is on how time should be spent on various existing accounts versus how much time should be spent on the development of new accounts. Cold calling is an expensive and time-consuming part of every salesperson's territory plan to find new accounts. A more effective approach to cold calling is to use the marketing database to identify potential companies, verify points of contact, and then develop a pre-call communication (perhaps an introduction letter to these points of contact) that is sent prior to the salesperson's cold call.

The research and pre-call communication address how to mitigate the potential customer reaction to a cold call such as, "I don't know you or your company, why should I talk to you?" Some studies have indicated it takes an average of seven sales calls on a new prospect before they will place a purchase order. By using the approach just described, the number of sales calls should be reduced because of the initial research and communication. (See the information on the cost of cold calls on page 16).

Measure Twice, Cut Once

The use of a marketing database allows the sales management to establish specific objectives for the sales team and then define an approach for the market segments they are interested in working. A targeted sales objective limited to a specific market segment that is actionable by the salesperson is the recommended course.

Identify the SIC or NAIC codes associated with the market segment. Gain consensus on the SIC or NAIC codes to approach, the geographic scope, company size, and the types of titles that would be involved in making a purchasing decision. A game plan to approach prospects should also be established. Then, use the marketing database to obtain prospect names, company profile information, addresses and contact information, and map out the locations, coding existing customers in a different color than prospects.

Review the list and maps to gain initial impressions, checking to see if any companies should be deleted. Determine what approach the sales person is comfortable with in approaching the new prospects and then send the sales people out to make the calls. Overall, when a business takes the time to be prepared by researching and knowing the potential markets, the marketing database will make sales calls less expensive and more efficient – allowing salespeople to do what they do best with their time – MAKE THE SALE. ■■■



Selecting a method to integrate existing customer data and potential customer data (data conditioning) is important. When combining internal files and purchased files, it is critical that duplicate records are eliminated and that existing customers are identified differently than potential customers.



Once the marketing database is prepared, it can be utilized to increase sales in many situations. Some instances that warrant the development and use of a marketing database include the hiring of a new salesperson for a growth territory. The salesperson will need to look for prospects to call on, which a marketing database can provide.

Federal PORs Begin Anew

THE LAST ISSUE of *Phase III Commercialization* magazine contained an article discussing the opportunities for Small Business Enterprise (SBE) executives who wished to transition their SBIR/STTR-seeded technologies into Programs of Record (POR). In particular, the article outlined the basics of technology maturation and readiness, as assessed through Technology Readiness Levels (TRLs). In addition the piece also discussed how an SBE could get a good glimpse into the funding profiles of various PORs (as well as mainstream S&T efforts) by looking up publically-available Program Element (PE) funding information.

by Alexander D. Stoyen



PE Status in FY2009 and Beyond

Stepping back to that article, we discussed PE 0604270N, a Budget Activity 5 (BA-5) System Development and Demonstration (SDD) effort Electronic Warfare Development. At the time of the article, the PE could be researched by going to www.js.pentagon.mil/descriptivesum/. On that site, the researcher would have discovered a past, current (at the time FY2009) and projected funding profile through FY2013. Yet when looking at the same PE using the current year in effect Oct. 1, 2009 (FY2010), the funding that comes up is only through the current FY2010 year. That begs the question, what happened to the FY2011-2013? Does this mean that the POR been cancelled? What is going on?

The Department of Defense, as with all Federal agencies, periodically re-visits its budget, priorities and individual programs and at those times there may be changes, and even cancellations of existing programs, as well as new starts. While this article cannot provide you with particular decision-making processes or information on the aforementioned PE, beyond what is available to the general public through proper channels, an SBE need only look at a random selection of PEs – all only showing funding through FY2010 similar to the PE0604270N example below – to think of a considerably more logical and reasonable explanation than the cancellation of all these PEs beyond 2010.

Planning, Programming, Budgeting and Execution

To maximize benefit to both the Armed Forces and the taxpayer, ensure quality, proper planning and various other desiderata, the Department of Defense provides Service, Joint and Milestone oversight over its acquisition process. A component of this oversight is the Planning, Programming, Budgeting and Execution (PPBE, formerly PPBS) process. The PPBE operates in two year cycles. Consecutive two year cycles are paired up and aligned with the four year Presidential election cycle. This reflects the fact that a new Executive branch administration may come in every four to eight years.

The four years in the two back-to-back two year cycles are each a bit different. The first year is review and refinement of baseline efforts. The new National Security Strategy is received, although there are typically limited changes to baseline programs and spending. This makes eminent sense because the (new) President is inaugurated in January (the second quarter or the current FY) as program execution is already in full swing for the year. To allow for Congressional discussion of the proposed Presidential Budget, the new President needs to submit the budget very soon following the Inauguration. Typically many key decision makers are yet to be confirmed for appointment. It is therefore prudent to allow the new Administration

time to assume the immense responsibility of management over the DoD and to absorb key programmatic information in sufficient detail to steer the DoD ship effectively and towards future successes.

Having had a year to learn and make good new decisions, in the second PPBE year the new DoD Agenda is formalized. DoD undergoes the Quadrennial Defense Review (QDR) and the new Presidential Budget request is aligned with this review. This is the year when normally the first set of major changes to programs may be introduced without disruption as would have been the case had such changes come in the middle of an on-going year. In the second year therefore we see new Program Objective Memorandum (POM) and Budget Estimate Submission (BES) submissions. In the third year prior acquisition guidance is executed. Similarly to the first year, there are limited changes to the previously requested baseline programs. In the fourth and final year, the legacy of prior requests is ensured. New POM/BES submissions are made. The following year, possibly with the next change of administration, the four year cycle starts anew.

Therefore, those SBE executives browsing PE information should not be alarmed when they discover that FY2010 updated information does not project to 2011 and beyond. It is simply that the new administration is working the PPBE in accordance with the process outlined above. It is likely tht some programs will be cancelled, some started, many changed, however, the process is proceeding as expected and there is no reason to worry. Advice to the many SBE executives who raise the question of “disappearing” PE funds, would be to use 2009 updated numbers as a rough planning guideline and to await updated information for FY2011 accordingly.

This article provides at most an introductory exposure to DoD processes, in particular the PPBE process, and is by no means a definitive or complete source of information on this topic. SBEs, under SBIR/STTR and other seed S&T contracts, would be advised to devote substantial resources to aligning their technological offerings with POR requirements, following budgetary guidance through the PEs as well as maturing technology (including informal technology readiness assessments and documentation and testing towards the same), and establishing corporate processes and other steps that serve to reduce technology insertion risk for prospective candidate PORs. ■■■

The DoD, as with all Federal agencies, periodically re-visits its budgets, priorities and individual programs.



PE can be researched by going to www.js.pentagon.mil/descriptivesum/.



Dawnbreaker has developed a website that provides guidance on these an other matters called the Phase III Portal. Please visit www.dawnbreaker.com/p3p/ for more guidance.

Appropriation / Budget Activity, May 2009
Research Development Test & Evaluation, Navy / BA-5

Cost (\$ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Total PE Cost	50.900	90.476	97.635			
0556 / EW Counter Response	31.583	68.971	26.486			
1742 / EW Technical Development & T&E	7.661	5.426	4.991			
2175 / Tactical Air Electronic Warfare	8.008	10.419	65.465			
2260 / Specific Emitter ID	0.744	0.674	0.693			
9999 / Congressional ADD	2.924	4.986				

Last year, PE's had projections through 2013, but due to the PPBE process, the PE to the left is what would be displayed for the current budget year.



States

5 ENERGY OPPORTUNITIES

by Julie A. Smith

RENEWABLE ENERGY has become a national priority, but as most small energy businesses have discovered, finding funding is still not an easy task. With nearly 20 technology designations that are classified as “renewable,” and funding options that range from private investment funds to government grants, loans and tax credits, finding the tools necessary to locate appropriate funds for a particular project is critical. By highlighting five states, this article will focus on some of the funding available on the state level, supply information on energy priorities of these states and provide some guidance on where details can be located for the other 45 states.

State Standards and Goals for Renewables

To start with, it is helpful to know what renewable technology each state considers a priority. The Pew Center on Global Climate Change provides a comprehensive list of the renewable portfolio standards (RPS) that 32 states have mandated, along with a list of the renewable technologies that each state supports. Visit www.pewclimate.org/what_s_being_done/in_the_states/rps.cfm to see if your state has an RPS and what technologies are a part of their funding priorities.

It is then advisable to research what programs the state has in place. Finding which state government office manages renewables is made simple by visiting the National Association of State Energy Officials (NASEO) website at www.naseo.org. NASEO provides a comprehensive contact list of state energy officers and provides reports on current programs and available funding in each state, which can save a small businessperson a good deal of research time.

BELOW AND ON THE OPPOSITE PAGE are the RPS goals, renewables of choice, state energy office websites and at least one funding opportunity for small energy firms in each of the five chosen states.

Renewable Energy Market Facts

The U.S. solar market size will surpass 1 GW in annual installations in 2010 for the first time. The total order book of identified PV projects as of June 2009 is 2.3 GW.

Hydropower accounts for 70 percent of produced electricity in the northwestern US.

Biofuels and biomass energy make up the largest portion of U.S. renewable-energy generation, producing 1.88 quadrillion BTU in the first half of 2008.



NEW YORK • RPS: 25% by 2013

The NY RPS identifies biogas, biomass, liquid biofuel, fuel cells, hydro, solar, ocean/tidal power, and wind as acceptable sources of energy.

New York Funding Opportunity

The New York Renewable Energy Research and Development Authority (NYSERDA) is the state energy department for NY. Their website www.nyserda.org contains a multitude of information for small businesses. One current funding opportunity for NY clean energy companies looks to support growth and development of said companies by supporting business activities that enable their expansion. Two rounds of funding have already taken place, with three rounds slated for 2010. The contact person for this program is Michael Shimazu (mhs@nyserda.org). To view other current funding opportunities through NYSERDA visit: www.nyserda.org/funding/funding.asp?i=2.



MONTANA • RPS: 15% by 2015

The Montana RPS identifies wind, solar, geothermal, hydroelectric, landfill/farm-based methane gas, wastewater-treatment gas, biomass and fuel cells as acceptable sources of renewable energies.

Montana Funding Opportunity

The Department of Environmental Quality (www.deq.state.mt.us/energy) is the main energy agency for Montana, though the Board of Research and Commercialization Technology (RCT) (businessresources.mt.gov/BRD_RCT.asp) is a direct source of funding for research and commercialization projects. The next proposal deadline for RCT funding is March 2010 with funding dispersed in July 2010. Matching funds are required. Awards range from \$20,000 to \$500,000. The RCT proposal guidelines for 2010 are located on the RCT website. Mr. Dave Desch (ddesch@mt.gov) is the RCT executive director.



NORTH CAROLINA • RPS: 12.5% BY 2021

North Carolina has identified solar, wind, hydropower, geothermal, ocean current or wave energy, biomass resources and energy efficiency measures as the renewable resources that meet their state standards.

North Carolina Funding Opportunity

Funded by the American Recovery and Reinvestment Act (ARRA), the North Carolina State Energy Office (www.energync.net) is managing the state-wide alternative fuel and renewable energy innovations program. Set to be funded with \$3.5 million, this statewide competitive grant program will promote innovation in developing and using alternative fuel and renewable energy. Examples of eligible projects include the support of biofuels development and funding renewable energy projects. For more information on the grant program, call the NC State Energy Office at (919) 733-2230.



MINNESOTA • RPS: 25% by 2025; Xcel Energy: 30% by 2020

The Minnesota RPS lists solar, wind, small hydroelectric power plants, hydrogen generated from renewable resources, and biomass from qualifying resources as meeting their state standards as renewable.

Minnesota Funding Opportunity

The Minnesota Department of Commerce (www.commerce.state.mn.us) manages the state's energy programs. They have multiple funding opportunities listed on their website via a report that was published at the end of October 2009. The report lists both state and federal opportunities (including loans, grants, tax incentives, etc.) open to energy-focused Minnesota businesses. The report is located at: www.energy.mn.gov under "project funding."



OREGON • RPS: 25% by 2025, 20 MW from Solar Photovoltaic

The renewable resources that Oregon listed in their RSP as meeting their standards were wind, solar, wave, geothermal, biomass, new hydro or efficiency upgrades to existing hydro facilities.

Oregon Funding Opportunity

The Oregon Department of Energy (www.oregon.gov/energy) provides an energy loan program, known as SELP, which provides low-interest loans to businesses and other community entities for projects that produce energy from renewable sources, save energy, use recycled materials to create products or use alternative fuels. For more information on the loan program visit the Oregon Department of Energy website or call the loan office at (503) 378-5048.



Locate your state allocation from the U.S. Department of Energy State Energy Program under the 2009 Recovery Act and the funding awarded to date by visiting:

apps1.eere.energy.gov/state_energy_program/recovery_act_awards.cfm.

BY THE NUMBERS:

SMALL BUSINESS FUNDING STATS

By all accounts the state of the economy has had a sobering effect on funding for the small business. The stats below highlight the current status and trends in SBA, Angel and VC funding.

SMALL BUSINESS INDICATORS: VENTURE INVESTMENT

		Venture investment: number of deals	Venture investment: total invested (\$ billion)
Last Five Years	2004	3104	22.1
	2005	3167	22.9
	2006	3705	26.3
	2007	3984	30.6
	2008	3929	28.1
Last Five Quarters	Q2-08	1059	7.6
	Q3-08	980	7.2
	Q4-08	884	5.7
	Q1-09	603	3.2
	Q2-09	612	3.7
Trends	This Q	+ 9	+ 0.5
	Q2-08 to Q2-09	- 447	- 3.9

Sources: Administrative Office of the U.S. Courts; Federal Reserve Board; National Venture Capital Association; U.S. Department of Commerce, Bureau of Economic Analysis.

"If necessity is the mother of innovation, scarcity just might be its father, or at least an uncle. While the current economic crisis is different from the 'tech recession' we experienced after the Internet bubble burst, there appears to be enough striking similarities to suggest that now is one of the best times to be investing in innovative early-stage companies. Altruistically, the supply of available talent continues to increase, the costs of the production tools (e.g., computers, equipment, etc.) have become more favorable, and market dynamics will improve for those early-stage companies that are able to find capital. The fact that valuations of such companies continue to become more favorable for those investors with the capital to invest doesn't hurt either."

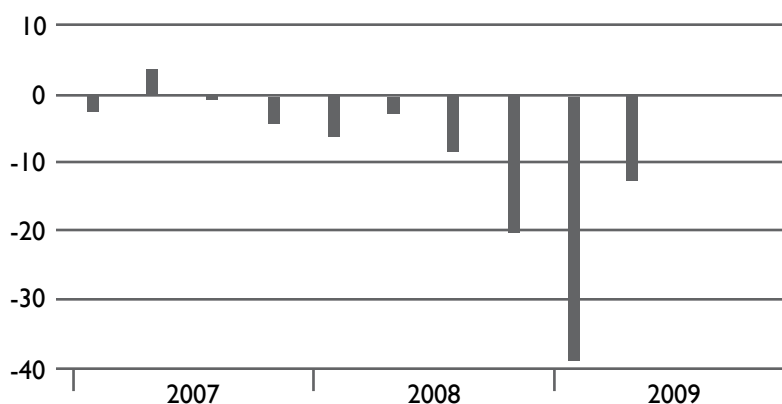
—Marc Averitt, Managing Director,
Okapi Venture Capital

SBA LENDING THROUGH THE RECESSION

SBA loans went to 25,000 fewer entrepreneurs in FY2009 than in FY2008, a 36 percent drop in year-to-year comparisons, though a rebound appears to be occurring with the assistance of the American Recovery and Reinvestment Act. September 2009 saw lending of \$1.3 billion, the best month of the year so far.

REAL PRIVATE FIXED INVESTMENT

COMPOUND ANNUAL RATES OF CHANGE



PRICEWATERHOUSE COOPERS/NATIONAL VENTURE CAPITAL ASSOCIATION MONEYTREE™ REPORT

AMOUNT INVESTED (IN BILLIONS)

Stage of Development	2007 Total	2008					2009			
		Q1	Q2	Q3	Q4	2008 Total	Q1	Q2	Q3	2009 YTD Total
Startup/Seed	\$1.4	\$0.4	\$0.45	\$0.4	\$0.3	\$1.6	\$0.2	\$0.6	\$0.5	\$1.3
Early Stage	\$5.8	\$1.3	\$1.4	\$1.3	\$1.3	\$5.3	\$0.7	\$1.1	\$1.0	\$2.9
Expansion	\$11.2	\$3.3	\$2.5	\$2.5	\$2.0	\$10.4	\$1.0	\$1.3	\$1.6	\$3.8
Later Stage	\$12.1	\$2.6	\$3.0	\$2.9	\$2.0	\$10.7	\$1.4	\$1.2	\$1.6	\$4.2
Grand Total	\$30.5	\$7.7	\$7.4	\$7.1	\$5.7	\$28.0	\$3.3	\$4.1	\$4.8	\$12.2

NUMBER OF DEALS

Stage of Development	2007 Total	2008					2009			
		Q1	Q2	Q3	Q4	2008 Total	Q1	Q2	Q3	2009 YTD Total
Startup/Seed	479	126	122	140	95	483	55	59	86	200
Early Stage	1,067	253	286	265	268	1,072	177	196	198	571
Expansion	1,277	336	328	280	279	1,223	176	192	185	553
Later Stage	1,199	300	331	309	262	1,202	208	210	168	586
Grand Total	4,022	1,015	1,067	994	904	3,980	616	657	637	1,910

Source: Thomson Reuters Investments by Stage of Development 2007 - Q3 2009

About Us...

Dawnbreaker® , Inc.

Dawnbreaker specializes in providing commercialization assistance to small advanced technology firms and their investors. Since 1990, we have worked with over 2,500 firms that have received funding from the Small Business Innovation Research (SBIR) program, the Small Business Technology Transfer (STTR) program, the Advanced Technology Program (ATP), and others.

Dawnbreaker's depth is in understanding the intent, method and objectives of the SBIR and STTR programs. Having worked within large corporations and small businesses, our staff understands the perspective and financial imperatives of both and is uniquely well-prepared to assist companies in planning for and succeeding in transitioning to Phase III (Commercial phase).

The success of our services is reflected not only in our track record, but also in the percentage of companies that receive investment and/or increased sales within 12–18 month of a programs' culminating *Opportunity Forum*®. To date, over \$2 billion has been secured by participating firms. For more information, visit our website at www.dawnbreaker.com.

Phase III Commercialization™ Magazine

Phase III Commercialization magazine is a publication of Dawnbreaker, Inc. and is meant to provide information, gleaned from our highly knowledgeable staff, to advanced technology firms, prime contractors, program managers and investors in the areas of medical, energy, defense and space exploration.

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