Pre-Seed Workshop
Six Year Study 2004-2010

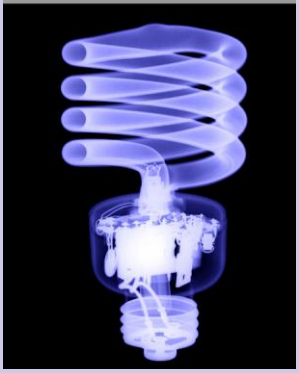
Part I: The Qualitative Story
Part II: Demographic Data on Teams & Companies Formed
Part III: Progress Metrics for Alumni Companies

Judith J. Albers
Mark W. Wilson

December 2010

For further information, contact:
mark@neworks.biz
judy@neworks.biz

PSW



www.psw-ny.org

Over the past six year, 203 Pre-Seed Workshop Teams,
primarily from major New York State research universities
have created 112 companies,
received an estimated $21 million in associated grant funding,
obtained $35 million from private equity and other sources,
and based on best-knowledge have created over 350 jobs in New York State
with the potential to create many more.

Acknowledgements

In New York State, we have held many conferences over the last decade to discuss the fact that we need to build an effective ecosystem that supports entrepreneurship. But six years ago, as PSW founders, we were growing weary of conferences and talk. We wanted to gather community stakeholders together – not for more discussion – but rather to analyze opportunities and build the foundational plans for pre-seed stage companies. We wanted to create repeatable events and integrate them into every community across New York State. But we couldn't do it alone.

We knew how to develop the curriculum and design all the program elements, but for the PSW to be successful, we needed to be "hosted" in each community. We needed a few committed individuals that would gather their entrepreneurial professionals together for 2½ days of intensive working sessions – technologists, lawyers, MBA students, serial entrepreneurs, tech transfer officers, industry expert, accountants that work with start-ups, and other value-added players. This is a major task. It takes a lot of effort to first find the "idea champions" that have an invention they might want to commercialize – and then to pull together all the different sectors of the community around those idea champions.

New York State is so fortunate to have, in every community, a few "do-ers". These are the folks that don't just want to talk about problems, *they work to solve them.* They roll up their sleeves and they do the heavy lifting. They generally don't get extra pay for going the extra mile. But they have a passion to support and work with entrepreneurs. And they believe in community collaboration to get the job done. These folks are the PSW Host-City Coordinators.

We are very grateful to all of our "HCCs" across New York State who have worked so hard to make the PSW program a success. From west to east, they are Marnie LaVigne and Renata Bator (Center of Excellence in Bioinformatics, U at Buffalo) in Buffalo, Rami Katz (High Tech Rochester) in Rochester, Heather Erickson, Carolynn Frearson (MedTech), and Emily Weldon (The Tech Garden) in Syracuse, Susi Varvayanis (Center for Advanced Technology in Life Science Enterprise, Cornell U) in Ithaca, Peter Pritchard (Center for Economic Growth) in Albany, and Sean Boykevisch and Joe Scaduto (Technology Transfer and Center for Advanced Technology in Biotechnology, Stony Brook University) on Long Island. Greg Stack (Technology Transfer, Clarkson U) in Potsdam and Mike Meador (AM&T) in Binghamton serve as Host-City Contributors for their regions. Before his retirement from Cornell, Roger Williams was our HCC in Ithaca, and continues to work to support the program in a number of ways.

The PSW program is also indebted to a few individuals that were there at the very beginning—our original steering team that played a critical role in the first few PSW pilots: Mark Coburn (then Director of Tech Transfer at the University of Rochester), Monte Estes (then of Boylan

Brown), Varda Main (then Director of Tech Transfer at Rochester Institute of Technology), Jim Senall (then of Greater Rochester Enterprise), and Paul Wetenhall (then Director of High Tech Rochester).

We're also grateful to those community professionals that volunteer over and over again in our workshops, especially our "groupies" -- there are many who are in our "hall of fame" for most PSWs attended. And of course, none of this would be possible without the generous support of our community sponsors who make cash contributions to each and every event. A special thanks to NYSERDA for their support and implementation of the PSW Energy Team Scholarship Program.

Like the Master Card commercials, the value that has been brought to bear on the PSW by our friends and associates is personally "priceless" to us. More importantly, because of the diligence of our supporters, the impact that the PSW has had on many participants across the state has been "even more priceless". Based on the feedback we have received from nearly 1300 participants so far, we know that the PSW has significantly changed the direction of a few lives and had an important impact on many others. It has helped shape pre-seed stage ideas to maximize their potential for success and this has positively bolstered the entrepreneurial culture in New York State.

There is something deep within the human spirit that drives us to build and create things of value. It is the driving force of free enterprise and it is what drives entrepreneurs. This is the spirit that brings us all together for each and every workshop. And it is why we created the PSW.

"The best reason to start an organization is to make meaning –
to create a product or service that makes the world a better place."

Guy Kawasaki
Founder, Garage Technology Ventures
Author, The Art of the Start

Mark Wilson and Judy Albers
Rochester, New York
December, 2010

TABLE OF CONTENTS

Part I: The Qualitative Story

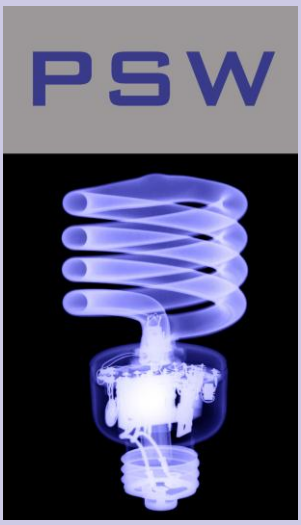


TABLE OF CONTENTS

I. Introduction

The Pre-Seed Workshop (PSW) is a two and a half day "build-a-company" community event. It is designed primarily to provide technology transfer offices at universities with a robust, high-level, community-based, quick-screen mechanism to evaluate the commercial potential of inventions being developed on their campuses. Beyond the singular event, a sustainable PSW program helps to create a healthy pre-seed entrepreneurial pipeline in a region.

The PSW rallies highly-skilled community talent and resources around academic researchers with patented inventions. Generally, five to eight teams are assembled for each workshop but the platform works for any number. The teams are led through a series of structured hands-on sessions where they investigate and transform potentially commercializable technologies into pre-seed stage companies or licensing opportunities. Teams leave the workshop with a first-cut commercialization plan for their inventions.

The PSW was launched in Rochester in 2004. Within the four years that followed, it spread throughout New York State to Buffalo, Ithaca, Geneva, Syracuse, Albany, NYC and Long Island. Between September 2004 and August 2010, 34 workshops were held. 203 teams have participated in the PSW staffed with 1,283 professionals. 112 alumni companies have built their first business case at the event or were formed as a direct result of the PSW. Now with six years of data, we want to celebrate the success of the PSW by documenting our results.

Our documentation consists of a three-part white paper series. In this first document (Part I), we tell the story of the PSW in qualitative terms. In Part II, we analyze and summarize the demographic data for the teams and companies formed. Part III delves deeper into how the teams and companies faired after the workshop.

In the PSW, we tell our participants that if they intend to pitch their new business/technology/ product concept to potential investors that they should first tell those investors why there is a market need: *"Investors generally don't even care what you've got until they know that there is a need for what you've got. First talk about the problem; then offer up your solution."* In following our own advice, we'll kick off this white paper series by talking about "the need".

II. The Need

The need for the PSW is fundamentally related to the fact that New York State ranks #2 in the nation for university-based R&D expenditures, second only to California, as shown below. In New York, $4B is expended annually in technology development just at its universities.

In addition, several other nationally recognized research institutions such as Brookhaven National Laboratory, Cold Spring Harbor and Roswell Park Cancer Institute push the annual R&D investment to nearly $4.5 B annually. The total research expenditure divides almost evenly between Upstate and Downstate. $2.0B is expended Upstate and $2.5B Downstate.

Rank	State	2008 R&D in $M
1	California	$7,026
2	New York	$4,045
3	Texas	$3,744
4	Maryland	$2,747
5	Pennsylvania	$2,604
6	Massachusetts	$2,272
--	Rest of Country	$29,471
--	Total	$51,909

Source: NSF Fiscal Year 2008 Survey of R&D Expenditures at Universities and Colleges

New York State University R&D

Historically, this level of academic R&D activity has largely been off the radar screen of community stakeholders throughout the state while massive layoffs have been occurring at our major corporations. But recently, there has been an awakening. Now, many stakeholders are looking to our regional universities and research centers for their economic development potential. They are now wondering and asking if the foundational technologies being developed therein could form the basis of new start-up companies that generate revenues and jobs. While there are occasional spin-outs, it doesn't seem to happen often enough. There seems to be an enormous amount of unrealized potential for creating start-ups based on academic R&D in NYS.

Further, an increasing number of researchers are starting to think about commercializing their technologies to receive the personal satisfaction of seeing their inventions and patents benefit society rather than sit idle in a filing cabinet (as do over 90% of patents generated across the country). Start-ups companies are not the only path to market -- technologies can also transfer into established companies to enhance existing products or create new ones.

And so $4.5 billion per year—a number that tops the R&D spending of Apple, Google and 3M combined and surpasses all but the top twenty-five largest R&D spenders in the world—dangles as a tantalizing carrot of opportunity for providing some economic benefits and returns on taxpayers' investment.

III. The Pre-Seed Gap

Six years ago, conversations among constituents in the entrepreneurial community about the challenges in creating university-based start-ups seemed to consistently focus on the "pre-seed gap" in the commercialization continuum. This is the point at which a scientist in a research lab is starting to wonder whether they have a sophisticated high-tech invention or if they actually have the foundation for a pre-seed company.

At this point, someone needs to conduct an opportunity analysis. But most academic researchers don't know the business questions to ask. Their technology transfer officers generally don't have the bandwidth or skill set to thoroughly investigate the opportunity. Community business professionals and MBA graduates who could potentially help are physically disconnected from researchers. Meanwhile, months and years pass by as a scientist continues to "wonder" …. and the economy fails to reap the benefits of taking their R&D to market. Efficient methodologies are needed to investigate new technologies and patents for their commercial potential.

The founders of the PSW recognized the confusion that inventors in the universities face versus the enormity of talent in the community. They surmised that if these resources were brought together for an intensive, hands-on, two day workshop to analyze and explore the start-up potential of a new invention, the result could potentially be (as one of our sponsors called it) "*Magic!*". Backed by a steering committee of key local stakeholders, the founders spent the summer of 2004 further developing the concept, the structure, the organizational protocols, and most importantly, writing the curriculum for the PSW.

IV. The PSW Solution

The structure and curriculum that was developed for the PSW provides an efficient way to take between 5-10 (or any number of) high-tech ideas from 1-4 universities or research centers and move them from the concept to the pre-seed stage. At the same time, and maybe just as importantly, the PSW vets ideas that possibly shouldn't go forward. The workshop's primary goal is to help potential entrepreneurs move off the point of indecision, by determining the commercial merit of an idea, assessing the team's start-up fortitude, and for those ideas that do have commercial merit, organizing the idea to move ahead.

Format: The workshop primarily consists of nine idea analysis sessions that focus on the Technology, the Market, the Competition, the Business Model, etc.

Product: As teams are lead through these nine modules, they address 20 key questions and generate a series of about 12-13 slides that constitute the foundation of a 15 minute presentation. They deliver that presentation on the afternoon of the second day before a panel of community experts, generally Angel or VC investors. These experts provide feedback on each team's business case, with a particular slant towards whether it could scale into a large business for the region.

Teams: The team which conducts the analysis simulates an actual start-up company with members who have diverse expertise. Teams always have an Idea Champion and a subject matter expert in the technology (often these are the same person). Other members typically assigned to the team include an MBA student, an IP or business start-up attorney, an accountant, and a tech transfer officer. Most importantly, an experienced entrepreneur from the community is assigned and prepped to coach the team.

Community Integration: At the end of the workshop, the PSW provides its teams with vectors into the community. Those with high potential ideas are encouraged to take the next step and conduct an in-depth opportunity analysis, enter business plan competitions, participate in venture forums, attend entrepreneurship boot camps, and reach out to local incubators. The PSW is a "feeder system" into the various resources that each of our host communities already have in place.

V. Launch and Expansion

The first PSW event, held in September 2004, was organized and facilitated by the founders with financial support from the Rochester community. Participating universities were the University of Rochester and the Rochester Institute of Technology. This pilot was so successful that the steering team immediately began planning a second workshop for the Spring of 2005.

Through a number of road trips by the founders, the proactive outreach of the original Steering Team, and the now-growing pool of alumni-advocates, other targeted communities started to conduct pilots. In time, marketing became viral. In each major metro region across NYS, Host-City Coordinators (HCCs) were identified to introduce the program to their community. With the help of Tech Transfer officers throughout the state, our HCCs have identified technologists within their local universities that have potentially commercializable inventions. Collectively, their efforts have brought in participants from the 26 universities, colleges and research centers shown below.

Participating Universities & Research Centers		Business Schools
University of Rochester	Binghamton University	U of Rochester Simon School
U of Rochester Medical Center	University of Albany	RIT College of Business
Rochester Institute of Technology	Rennselaer Polytechnic Institute	Cornell Johnson School
Cornell University	Union College	UB School of Management
Cornell Ag Experiment Station	SUNY IT	Syracuse U Whitman School
University of Buffalo	SUNY Farmingdale	U of Albany Law School
Roswell Park Cancer Institute	SUNY Purchase	Columbia Business School
Hauptman Woodward	SUNY Downstate Medical	Stony Brook U College of Business
Niagara University	Rome Research Labs	
Syracuse University	Columbia University	
SUNY ESF	Cornell Weill Medical	
Upstate Medical	Stony Brook University	
Clarkson University	Brookhaven National Laboratory	

Community talent, including business, legal, and financial expertise, is required to build teams around the technologists. These are the lawyers, MBA students, serial entrepreneurs, etc. Venture capital and angel investors are brought in as panelists to provide feedback to the teams. On average, between forty to fifty high-level professionals from throughout the community volunteer their time for each workshop. Sponsors fund the events.

The table below lists all the organizations that have sponsored and participated in the PSWs. Besides the many research centers, our HCCs have collectively mobilized the financial and intellectual capital within 8 Business Schools, 16 Venture Capital and Angel Groups, 11 Law Firms, 6 NYS Centers for Advanced Technology and Centers of Excellence, 5 RTDCs, 5 Accounting Firms, 5 Economic Development Agencies, 5 Corporations, 4 State Agency, 3 Cluster Organizations, 1 Bank, as well as numerous independent consultants and other entities.

Law Firms
Heslin Rothenberg Farley & Mesiti
Lippes, Mathhias, Wexler, and Friedman
Jaeckle Fleischmann Mugel
Marjama Muldoon
Bond, Schoeneck, and King
Phillips Lytle
Hiscock & Barclay
Miller Mayer
Boylan, Brown, Code, Vigdor & Wilson
Hodgson Russ
Goodwin Proctor

Accounting Firms
EFP Rotenberg
Sciarabba Walker & Co
Dopkins & Company
Wojeski & Co
Kane Firm

Economic Development Orgs
Greater Rochester Enterprise
Buffalo Niagara Enterprise
Erie County Industrial Development Agency
Center State CEO
Syracuse Technology Garden

Banks
M&T

State Agencies
NYSERDA
NYSTAR
NYS Dept of Labor, Workforce NY
NYS SBDC

NYS CATs and COEs
UB CAT in Biomedical and Bioengineering
UB CoE in Bioinformatics and Life Sciences
Cornell Center for Life Science Enterprise
CASE Center
Stony Brook Center for Biotechnology
CEWIT at Stony Brook

NYSTAR RTDCs
Center for Economic Growth
High Tech of Rochester
AM&T
Insyte Consulting
CNY TDO

Corporations
Element K
Paychex
National Grid
Welch Allyn
Sensis

Consultants
numerous

Venture Capital Groups
Cayuga Ventures
Excell Partners
High Peaks Venture Partners
FA Tech Ventures
Onondaga Ventures
Trillium Group
Rand Capital
Rochester Angel Network
Seed Capital Fund of Central NY
Western NY Venture Association
TopSpin Ventures
Long Island Angels
NYC Angels
Stonehedge Capital
Milestone Venture Partners
Kodak Ventures

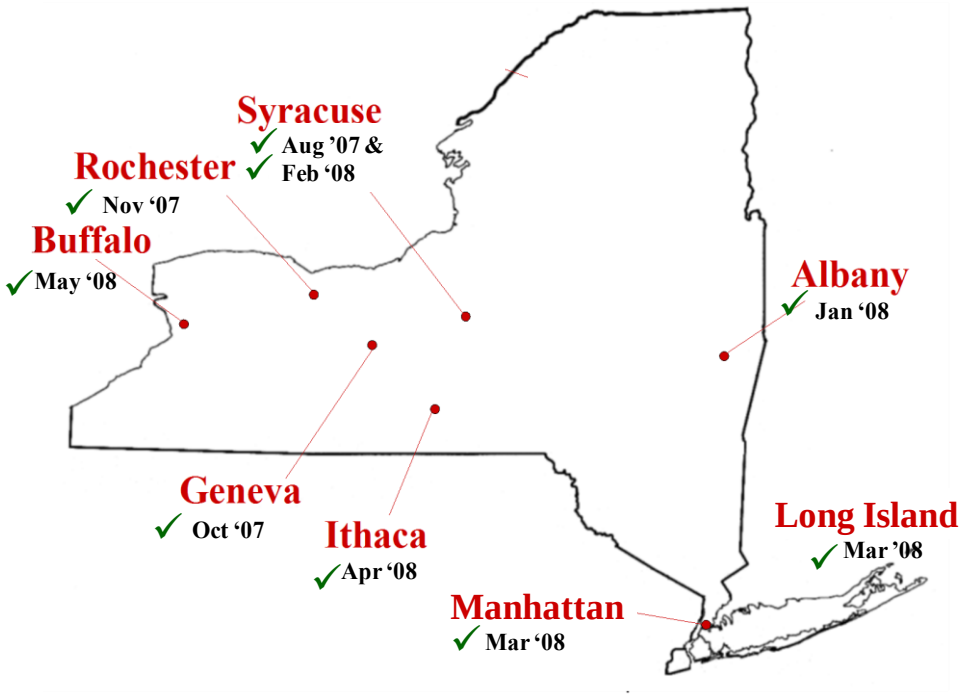
Cluster Organizations
MedTech
NY Biotech Association (NYBA)
NYC Biosciences Initiative

Others
Cornell Center for Materials Research
Entrepreneurship at Cornell
Cornell Ag & Food Tech Park

With nearly 100 major participating universities and organizations across NYS, PSW-NY has become the largest **grass-roots** initiatives facilitating the growth of entrepreneurship and the creation of start-up companies in the region.

VI. Deal Flow and Metrics

By the 2007-2008 academic year, the PSW was operating at what our HCC consortium felt was "full capacity". The workshops had been integrated into the key research hubs and distant areas were aligned with the hub regions for participation "seats". Eight to nine workshops per year seemed like an appropriate number to service New York State's pre-seed pipeline and one set of facilitators could manage that number. The PSW schedule, as it appeared for the 2007-2008 academic year is shown below:



A similar schedule has been replicated every year since. At this six-year point in mid-2010, the PSW can lay claim to the following metrics:

- 8 Host Cities
- 34 Workshops
- 1,283 Participants
- 203 high-tech ideas, that have been analyzed by 203 teams, resulting in
- 112 Alumni Companies

Over six years, 112 for-profit start-up ventures have been formed across the state with the potential to create wealth and jobs for the region. About 28% of our idea champions already had a legally incorporated company *before* attending the PSW but participated because they didn't have a solid commercialization plan or felt it was time to re-assess it. The remaining 72% of our idea champions were wondering if they should start a business or in some way commercialize

their technology. Of that 72%, 28% decided to legally incorporate *after* the PSW and 45% made the decision not to move forward. The table below summarizes these findings.

Based on Best Knowledge and Survey	Estimate	% of all Teams
Number of Teams legally incorporated as Company prior to PSW	56	28%
Number of Teams legally incorporating a Company after the PSW	56	28%
Teams that did not form Companies	91	45%
Total Number of Teams	203	100%

Incorporation Results

We are pleased with these results. In total, Pre-Seed Workshop has a pool of 112 alumni companies. We also count the teams that made the decision not to move forward in the "win column". Not all ideas should move forward, especially given the scarce availability of community resources to support the pre-seed stage. A region's pre-seed resources are precious and should be focused on the most promising ideas. If the PSW helped those teams realize that "their dog won't hunt", then it has provided a valuable service. Or possibly, some teams now have a better understanding of what they need to do to form the basis of a promising company.

The outcomes for our alumni companies are further discussed in Parts II and III of this white paper series. For now, we'll just report that many of our alumni have gone on to win local, national, and international business plan competitions. Many have received SBIR funding. Several have secured seed and venture capital. And many inventors have found experienced business managers through the PSW network to help them move forward with their start-up company.

VII. Comments from Participants

The success of the PSW would not have happened if the participants weren't excited about the program and if the sponsors didn't think they were benefiting from it.

Over six years and 34 workshops, from one end of New York State to the other, the participant response to the PSW has been tremendous and the enthusiasm has been high. Participant surveys are conducted after every event. In the category of "Overall Satisfaction", on a scale of 1 to 5 (1=poor and 5=Excellent), the PSW has consistently averaged between a 4.4 and a 4.8. Typically half of our participants rate the workshop as "Excellent" and the other half rate it as "Very Good". Over 90% of attendees indicated that the Pre-Seed Workshop is better than any other "build-a-business" training they have ever attended.

Since nearly 1,300 participants have provided feedback on their PSW experience, it would take many pages to do justice to all their comments. Going back to the beginning, we have included excerpts below that are representative of the excitement generated at these events and the typical feedback that we receive.

Rochester, Sept 2004

- Highly professional and well organized. Networking was very productive.

Cortland, April 2005

- Very rewarding. This workshop crystallized a lot of things for our team.
- The breakout sessions were exceptional and the feedback from the panel and audience was extremely valuable.

Geneva, Nov 2005

- For someone in the early development stage, the type of information and feedback received at this workshop was amazingly valuable.
- Really great. Packed with info and ideas.
- Good job of inviting different sectors of the community.
- Fast paced but appropriate to cover so much territory
- Very helpful and stimulating.

Buffalo, January 2006

- Great workshop. Very useful and very well organized

Rochester, April 2006

- Excellent! Clear! Concise!
- Our coach has been a fantastic help and I hope he continues to work with us.
- The workshop was a terrific way to build our confidence, network reach, and experience. I met a ton of great people here.
- Very good coordination and presentations.
- Great opportunity to try out ideas in the real world.

Syracuse August 2006

- Excellent. Just what this community needs to help rev the technology business development in the region.

Ithaca Nov 2006

- This has been an excellent opportunity that came just at the right time. I now have a more concrete vision for my company. This helps me communicate more effectively with people who are involved in my company. I have found new support and I am beginning to move the company in new directions. Thanks for all the support and hard work that went into this.
- I normally hesitate to give perfect scores, as this is not usually a great way of giving feedback. On the other hand, here I think the material truly is excellent, certainly when considered as being designed for inventions across a spectrum of technologies and applications. Great, great workshop.
- The PSW was definitely a valuable addition to my coursework and time well spent even during this busy core semester.
- Within the space of one week, issues that we had faced for years, began to clarify and knowledge and insight gained at the workshop haven given muscle and vigor to my company…. I feel I have some tools now to move forward and some direction as to where to go next. I now have potential contacts for lawyers and realize there are people out there who do want to grow businesses and are willing to make partnerships that can flourish.

Albany, Jan 2007

- I hope the program will become a regular feature across the State. I am a bit surprised that so many volunteers are willing to be coaches, legal support, etc. Overall I am very impressed.
- How often are we ever thrilled with a process? If I were to have written down my most imaginative expectations, I would never have come up with a workshop like this. I am a changed person for it. Everyone went beyond what was expected. This was not a simple "ho-hum-we've-done-all-this-before." It was fresh, intense, exuberant.

Syracuse, Feb 2007

- This is my first time attending and I found the whole process to be very interesting. Day 1 was broken down into manageable, well-organized, clearly directed segments.
- This was a great event – well-planned, well-presented, and with real outcomes!
- I think the workshop is an excellent tool and should be held as often as possible to get ideas, examples, and training stimulating entrepreneurship. Thank you for your excellent work.
- Special thanks for a job well done. I learned much and will carry these guidelines with me well into the future. You should continue this workshop, especially in the upstate NY region.

Ithaca, March 2007

- The format (short descriptions of what to do next, and then doing it) was good but exhausting. I think we have seen the tip of the iceberg of what is involved with starting up a business but at least we now have an idea of the extent of the iceberg.

Syracuse August 2007

- Our former department head described one of our courses as "Give'n 'um a drink from a fire hose." I think this is an appropriate description of your workshop!
- The PSW is an excellent resource for our state. There are plenty of technologies here. What is needed, and what the PSW provides, is a business framework for creating businesses around our state's technology.
- The panelists provided a good range of perspectives and each seemed to have valuable different areas of interest and focus.

Geneva, Oct 2007

- Thanks again for making the PSW possible. Our team greatly benefited from the workshop both with regards to thickening our ideas and strategies as well as through networking with other participants. On top of it all, we had a great time!

The survey results continue for twenty-two more workshops which occurred between 2008-2010 from Buffalo to Long Island. But we'll stop there. The message is simple. Those who attend truly enjoy and benefit from the program.

VIII. Next Steps

The PSW has been successful because program managers and business development directors at our local and regional incubators and high-tech centers have decided that this is a unique and effective program. Host-City Coordinators (HCCs) have been doing a tremendous job at the

local level organizing workshops and raising sponsorship. Community members and organizations have stepped up to the plate in a major way to support the PSW each and every time with financial and in-kind support.

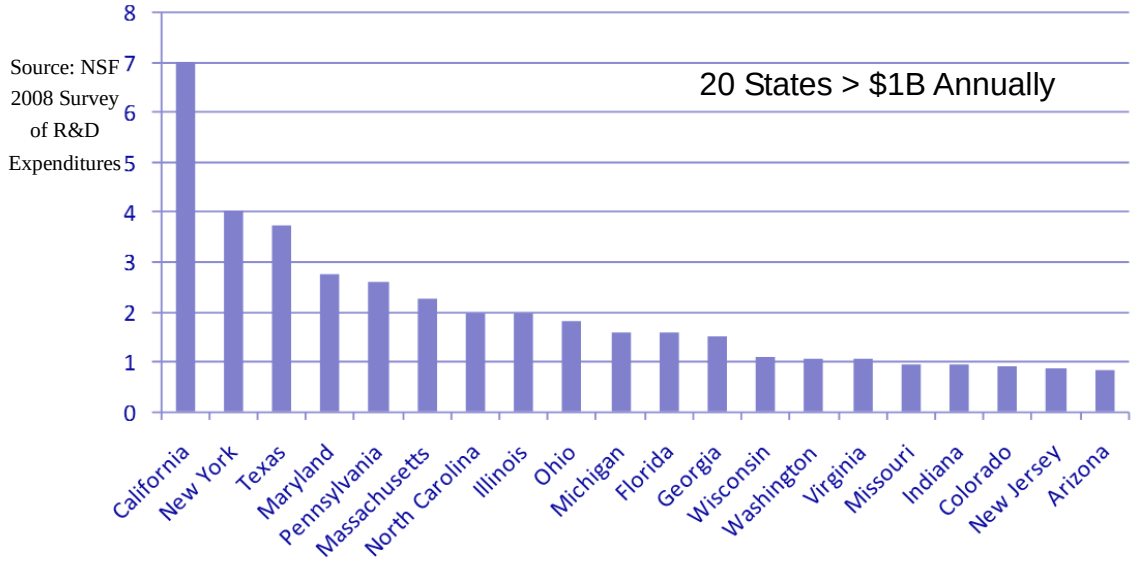
While there has been sponsorship for each community event, there have been no allocations received for administration at the state-wide level. Yet, the need for state-wide coordination continues to grow. Between the 7-9 events per year, there is a need for coordinating a central calendar at the state level, opening enrollment across the state, cross-fertilizing the metro regions, updating a central database of all participants, continuing to track success metrics and generating reports, updating and producing printed materials, and maintaining the website--just to name the basics. There is also a need to implement a "Train the Trainer" program so that the PSW can be scalable.

At the local level, the Hosts need help integrating the Pre-Seed Workshop with other entrepreneurial programs in a meaningful and effective manner. There is a general need for marketing the existing community programs, making better connections to the business community, gaining cooperation from the business schools, and increasing outreach to and from the tech transfer offices.

The PSW continues to look for funding champions that could support a relatively inexpensive state-wide program and provide critical support to our regional Hosts.

IX. Scalability

The applicability of the PSW can be extended to any community within or outside New York State which desires to leverage latent or emerging technologies into start-up companies which can create jobs and generate revenues. More than $50B is expended annually in university-based research, the majority of the funding coming from the federal government.



University R&D Expenditure

As shown above, there are twenty states, including New York, that expend at or over $1B annually.

What we achieved with the PSW in NYS can be replicated in many states and we are moving in that direction. In October 2010, the first South Bend, Indiana PSW was held with teams from the University of Notre Dame. Discussions are underway to expand the program throughout that region.

X. Conclusions

Part I of the "PSW Six Year Study" was intended to tell a qualitative story about the PSW where the original objective was simple. We saw that New York State is #2 in the nation for university-based R&D, where $4.5B is expended each year, and yet we knew that most of that research was being "under-commercialized". We set out to help fix the problem. We created a program to gather community professionals together to conduct in-depth quick screens of potentially commercializable technologies to determine if they could form the basis of start-up companies. The program has been adopted throughout New York State.

Now, throughout the state, on a periodic basis, in each community, our best and brightest "pull in the same direction" for two and a half solid days to help launch the companies of tomorrow. "Everyone" talks about collaboration -- the PSW event provides a tangible event to foster this interaction within the community. It also promotes inter-regional collaboration and the exchange of knowledge and ideas throughout the state. As we look to the future, we believe there continues to be great opportunity for the PSW, along with collaborating programs and organizations, to transform the economic landscape of New York State and well beyond.

Part II: Demographic Data on Teams & Companies Formed

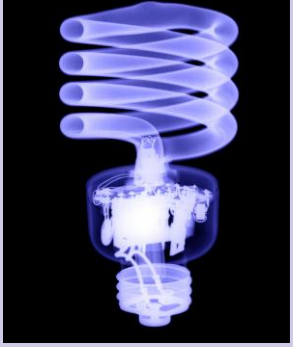
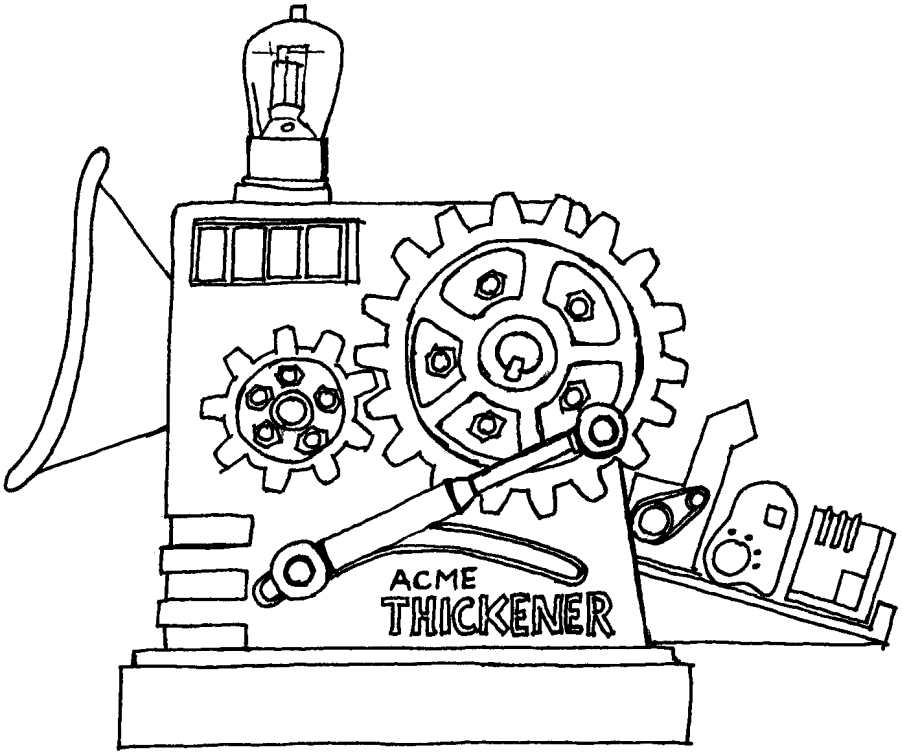


TABLE OF CONTENTS



I. Introduction

In Part I of our three-part PSW White Paper series, we provided a qualitative story about PSW. In Part II, we begin to quantify the results and focus on demographic data. Like any report on demographics, this is all about documenting "the numbers". In our case, we needed to determine how many PSWs were held, where were they held, how many teams participated, where the teams originated, how many companies were formed, what industries were represented, etc.

The data tables, graphs, and charts included here are primarily for those who need this information, our Host-City Coordinators, our sponsors, and any other community stakeholders. Throughout most of the paper, the text is intended to guide the reader through the maze of data and point out some highlights along the way.

In Part III, we begin to assess outcomes for our alumni companies and a story starts to emerge about the success of the PSW. Those readers who may not be interested in all the demographic data should feel free to skip to other papers in our series. But for those who need the details, we will begin with some basic metrics here.

II. Basic Metrics

So, just how many PSW have been held? Figure 1 below lists the past PSWs in chronological order, along with statistics related to the number of teams and participants. The number of alumni companies formed or graduated from each workshop is also tallied.

No	Location	Month	Year	No. of Teams	No of Participants	Alumni Companies
1	Rochester	Sept	2004	6	26	2
2	Rochester	April	2005	6	32	2
3	Cornell (Cortland)	April	2005	3	18	3
4	Cornell (Geneva)	Nov	2005	5	27	4
5	Buffalo	Jan	2006	6	17	5
6	Rochester	April	2006	8	49	4
7	Cornell (Ithaca)	April	2006	6	35	4
8	Syracuse	Aug	2006	8	51	3
9	Cornell (Geneva)	Nov	2006	6	45	5
10	Albany	Jan	2007	6	32	2
11	Syracuse	Feb	2007	5	43	2
12	Cornell (Ithaca)	Mar	2007	6	38	3
13	Syracuse	Aug	2007	6	36	0
14	Cornell (Geneva)	Oct	2007	5	35	2
15	Rochester	Nov	2007	8	52	4
16	Albany	Jan	2008	6	45	4
17	Syracuse	Feb	2008	3	18	2
18	NYC	Mar	2008	3	25	0
19	Long Island	Mar	2008	6	32	1
20	Cornell (Ithaca)	April	2008	5	33	3
21	Buffalo	May	2008	6	45	5
22	Rochester	Nov	2008	12	63	9
23	Syracuse	Feb	2009	4	30	3
24	Albany	Feb	2009	4	33	3
25	Long Island	Mar	2009	6	45	3
26	Buffalo	Jun	2009	9	66	6
27	Syracuse	Aug	2009	6	40	4
28	Albany/RPI	Sept	2009	6	31	3
29	Rochester	Nov	2009	8	52	5
30	Syracuse/I-81	Feb	2010	5	31	3
31	Long Island	Mar	2010	5	29	2
32	Cornell (Ithaca)	April	2010	6	39	4
33	Syracuse/I-81	April	2010	6	33	3
34	Buffalo	June	2010	7	57	4
34	**Totals**			**203**	**1283**	**112**

Figure 1: PSW Basic Metrics

This table tells us that 34 workshops have been held with 1283 participants staffing 203 teams. Of those teams, 91 (or 45%) did not result in a legally incorporated company. Possibly the technology or business concept is still being advanced but there is currently no legal entity.

However, 112 (or 55%) did result in an "alumni company". This is a very high success ratio for research trying to emerge from the laboratory. We estimate based on survey data that about half of those (56) legally incorporated prior to the PSW and participated because they did not have a solid commercialization plan or felt it was time to "re-assess" it. The other half of our alumni companies (56) made the decision to legally incorporate after the PSW.

Table 2 below provides a regional look by summing up the number of PSWs that have been held in each region, along with a summation of the number of teams, participants, and alumni companies.

Location	Start Date	No. of Workshops	No. of Teams	No of Participants	Alumni Companies
Syracuse	Aug 2006	8	43	279	20
Ithaca/Geneva	Apr 2005	8	42	270	28
Rochester	Sep 2004	6	48	274	26
Buffalo	Jan 2006	4	28	185	20
Albany	Jan 2007	4	22	141	12
Long Island	Mar 2008	3	17	106	6
NYC	Mar 2008	1	3	25	0
Totals		**34**	**203**	**1283**	**112**

Figure 2: PSW Basic Metrics per Region

III. Industry Sector Representation

The industries represented by the 203 participating teams are shown below in detail.

Location	Biotech	Industrial & Energy	Med Devices	Software	Electronics & Instrument-ation	IT Services	Consumer Products	Health Services	Telecom	Business Services	Networking & Equipment	Semi-conductors	Other	Total Check
Rochester	6	6	10	10	0	4	5	1	4	2	0	0	0	48
Syracuse	7	15	2	7	6	2	1	2	0	0	0	0	1	43
Ithaca/Geneva	16	7	6	3	5	4	0	0	0	0	0	1	0	42
Buffalo	12	5	6	0	1	0	0	3	0	1	0	0	0	28
Albany	5	7	0	1	1	3	2	0	0	0	2	0	1	22
Long Island	8	2	4	2	0	0	0	0	0	0	0	0	1	17
NYC	1	0	1	1	0	0	0	0	0	0	0	0	0	3
Total	55	42	29	24	13	13	8	6	4	3	2	1	3	203
Percent	27%	21%	14%	12%	6%	6%	4%	3%	2%	1%	1%	0%	1%	100%

Figure 3: All Industry Representation

A pattern of "industry foci" seems to be emerging in the different regions. For example, in Ithaca/Geneva, Buffalo, and Long Island, a majority of the teams seem to be focused on biotech. In Syracuse, the emphasis is on energy. Rochester appears to have a concentration in medical devices and software.

We aggregated the results, and the six major industries represented in the state as a whole are illustrated in the following pie chart. 27% of the participating teams were investigating a new biotech opportunity. About 21% were energy-related. Another 14% were medical device teams. Software and IT combined were about 18% of the teams. Electronics & instrumentation was also a strong category.

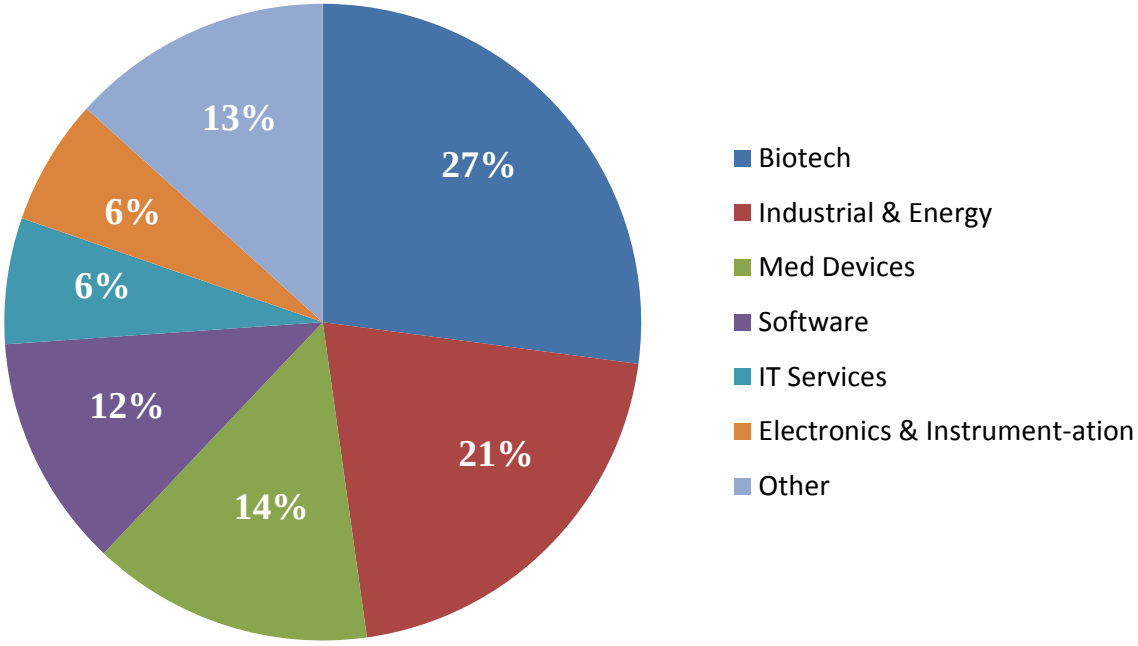


Figure 4: Major Industries Represented in NYS

We should note here that in 2009, PSW-NY was awarded a grant from NYSERDA to provide scholarships to energy teams. During the 2009-2010 academic year, 12 scholarships were awarded. Table 5 shows where they were awarded, the specific categories of energy technologies, and the university association of the technologies.

Location	# of Scholarships
Syracase	4
Buffalo	3
Albany	3
Rochester	2
Ithaca	0
Long Island	0
Total	12

Category	Sub-Category	# of Scholarships
Renewable Energy	Solar	5
	Wind	2
	Ocean	1
	Biomass	1
Transportation	Vehicles	2
Industrial Processes	Materials	1
Total		12

University Affiliation	# of Scholarships
U at Buffalo	2
RIT	1
Clarkson U	1
Cornell	1
RPI	1
none	6
Total	12

Figure 5: Energy Scholarship Metrics

IV. University Participation Levels

The PSW is primarily designed to support university Tech Transfer offices. Figure 6 lists the number of teams that are affiliated with a university either through IP, staff or students, and that participated in their local region.

Institution	Point of Participation	Number of Teams
Cornell U	Ithaca / Geneva	35
U Rochester	Rochester	25
U Buffalo	Buffalo	15
Syracuse U	Syracuse	14
RIT	Rochester	13
Stony Brook U	Long Island	12
RPI	Albany	8
SUNY ESF	Syracuse	6
Roswell Park	Buffalo	5
Clarkson U	Syracuse	5
Upstate Medical	Syracuse	5
Binghamton U	Syracuse	2
U Albany	Albany	2
Cornell Weill	Ithaca / Geneva	1
Cornell Weill	Long Island	1
Cornell Weill	NYC	1
Niagara U	Ithaca / Geneva	1
Niagara U	Buffalo	1
UB/RPCI	Buffalo	1
Hauptman Woodward	Buffalo	1
Corning	Rochester	1
Union College	Albany	1
SUNY Purchase	Albany	1
SUNY IT	Albany	1
SUNY Farmingdale	Albany	1
Downstate Medical	Albany	1
Rome Research Labs	Albany	1
Brookhaven Nat'l Lab	Long Island	1
Columbia U	NYC	1
Total		163

Figure 6: University Participation

Of the 203 teams that have been through the PSW, 163 (or 80%) had a university affiliation and participated in their local region.

As might be expected, the largest research universities in NYS are the most active in the PSW. The largest universities expend between $250-750M annually in R&D. If we compare Figure 6 with Figure 7 below, we can see, in general, a strong correlation between amount of R&D and the number of PSW teams. Cornell, U of Rochester, U of Buffalo, Stony Brook U are top universities on both lists. Syracuse U, RIT, RPI, SUNY ESF, Roswell Park, Upstate Medical, Clarkson U are below $100M annually in R&D but are nonetheless quite active in the PSW for medium sized research institutions.

Institution	R&D
Cornell U	$653,996
U Rochester	$375,218
U Buffalo	$338,300
U Albany	$270,414
Stony Brook U	$252,745
RPI	$77,295
U Binghamton	$59,017
Syracuse U	$38,455
Upstate Medical	$36,359
SUNY ESF	$26,359
RIT	$24,018
Clarkson U	$17,654
Other	$59,800
Total for Upstate & Long Island	**$2,229,630**

Source: NSF Fiscal Year 2008 Survey of R&D Expenditures at Universities and Colleges

Figure 7: R&D Expenditures at Major Universities in PSW Footprint

If we add in a time element, then we have an indication of "tempo" and about how many teams per year participate in the PSW within their local region.

Institution	Point of Participation	Number of Teams	Number of Years	Teams per Year
Cornell U	Ithaca / Geneva	35	5	7.0
U Rochester	Rochester	25	6	4.2
Stony Brook U	Long Island	12	3	4.0
U Buffalo	Buffalo	15	4	3.8
Syracuse U	Syracuse	14	4	3.5
Clarkson U	Syracuse	5	2	2.5
RIT	Rochester	13	6	2.2
RPI	Albany	8	4	2.0
Binghamton U	Syracuse	2	1	2.0
SUNY ESF	Syracuse	6	4	1.5
Roswell Park	Buffalo	6	4	1.5
Upstate Medical	Syracuse	5	4	1.3
U Albany	Albany	2	4	0.5

Figure 8: Tempo of University Participation

Again, Cornell tops the list, followed by U of Rochester, Stony Brook U, U Buffalo, Syracuse U, etc. Possibly the only numbers that seem out of line might be the U of Albany where research levels are very high but participation in the PSW is low.

We would also like to note here that the PSW encourages "cross-regional fertilization". Since the PSW is generally only held once a year in each community, the timing for an Idea Champion may be such that it works best to attend a PSW in another region. We have tracked our "visiting teams" and the extent to which cross regional cooperation has occurred. This is shown in figure 9.

Institution	Point of Participation	Number of Teams
U Buffalo	Ithaca / Geneva	2
Syracuse U	Ithaca / Geneva	1
Cornell U	Syracuse	2
URMC	Buffalo	1
Cornell U	Rochester	1
Binghamton U	Rochester	1
Total		8

Figure 9: Cross Regional Fertilization

V. Corporate and Community Participation

While the focus of the PSW curriculum is generally on university teams, it can just as easily serve to vet new commercialization concepts coming from large corporations. In one Syracuse PSW, we had two teams from Sensis Corporation.

Institution	Point of Participation	Number of Teams
Sensis	Syracuse	2

Figure 10: Large Corporate Participation

As shown in Table 11, some of our teams are not affiliated with either a research institution or a large corporation. They are independent technologists from the community or they belong to small companies that may be looking to evaluate a new product.

Community Participation	Number of Teams
Rochester	7
Syracuse	7
Albany	6
Buffalo	4
Long Island	3
Ithaca / Geneva	2
NYC	1
Total	30

Figure 11: Community and Small Company Participation

So, in summary, between 2004-2010, 80% (163) of our teams were from local research universities or centers and 4% (8) of our teams were "cross-pollinated" from universities in other regions. This bring us to a total of 84% (171) teams affiliated with an academic center. 1% (2) of our teams were from large corporations, and 15% (30) were from the local community or small companies.

VI. Alumni Company Affiliations

A primary objective of the PSW is to bring in teams that have raw business ideas and concepts and work with them to thicken those ideas to the point where they solidify. That is, we are building real companies. At this point in our demographic study, we know that we have helped build 112 alumni companies. Beginning with this next section, our demographic analysis will focus just on those 112 Alumni.

In the pie chart of Figure 4, we illustrated the industry sectors represented by the different teams in a pie graph, Figure 4. Figure 13 below shows the industry sectors represented by the Alumni companies.

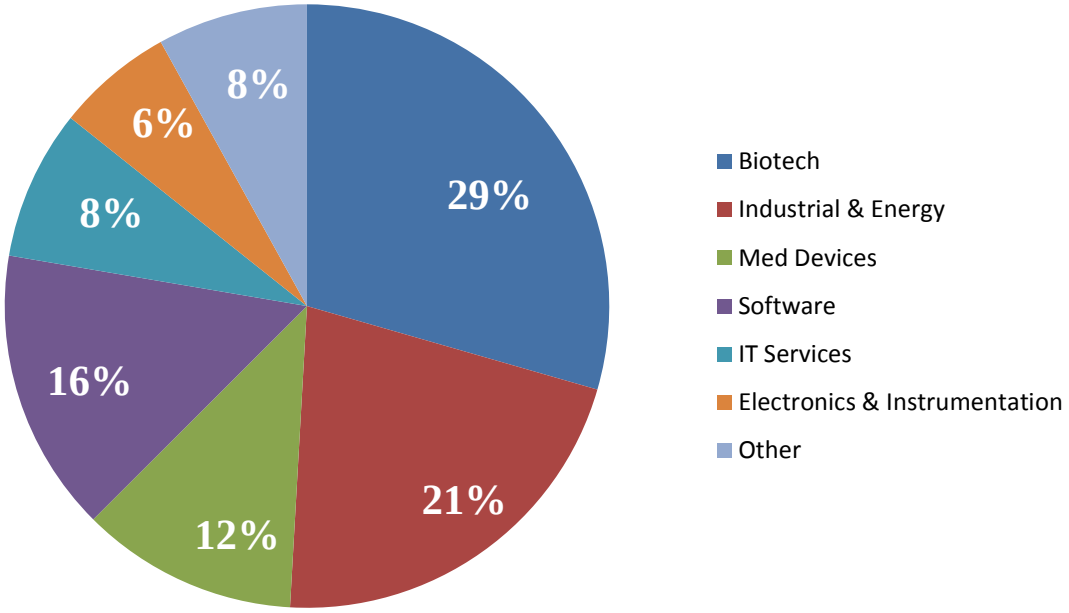


Figure 13: Distribution of Industries for Alumni Companies

There are no surprises here. The distribution of industries in Figure 4 versus Figure 13 is very similar. Possibly of note is the slightly higher percentage of software companies that launched relative to the number of teams. This certainly could be attributable to the fact that the risk and cost to start a software company tends to be lower than for many other industries.

Figure 14 shows the university affiliations of the alumni companies.

Institution	Point of Participation	Number of Alumni Cos.
Cornell U	Ithaca / Geneva	26
U Buffalo	Buffalo	13
U Rochester	Rochester	8
Syracuse U	Syracuse	8
RIT	Rochester	7
Stony Brook U	Long Island	3
URMC	Rochester	3
RPI	Albany	3
Roswell Park	Buffalo	3
Clarkson	Syracuse	3
SUNY ESF	Syracuse	1
Upstate Medical	Syracuse	1
Binghamton U	Syracuse	1
U Albany	Albany	1
Cornell Weill	Ithaca / Geneva	1
Cornell Weill	Long Island	1
Niagara U	Buffalo	1
Hauptman Woodward	Buffalo	1
Union College	Albany	1
SUNY Purchase	Albany	1
Rome Research Labs	Albany	1
Brookhaven Nat'l Lab	Long Island	1
Total University-Affiliated Companies		89
Total Non-University-Affiliated Companies		23
Total Companies		112

Figure 14: University Affiliation of PSW Alumni Companies

Cornell's number of PSW alumni companies is a whopping 28 (26 in Ithaca/Geneva and 2 at Cornell Weill). That is a quarter of all of our alumni companies and nearly a third of all our university affiliated alumni.

VII. Where Are They Now?

Through an on-line survey, diligent tracking, personal knowledge, and working in conjunction with our Host-City Coordinators, we attempted to determine the current status of all alumni companies. Figure 15 shows those results.

From a purely statistical perspective, this table tells us that 75% (or 84) of the companies are still operational in NYS. 11% (12) started and closed. 4% (3) eventually licensed their technology rather than continue as a start-up company. 3% were actually new products within an existing business. Three companies moved out of state. Two companies were acquired. One merged with a larger company. One idea champion left the company. And the status of two could not be determined.

Location	Alumni Companies	Where Are They Now?								
		Still Operational	Started and Closed	Licenses	New Products	Moved Out-of-State	Acquired	Merged	Idea Champion Left Co.	Unknown
Buffalo	20	16	2	0	0	1	0	0	1	0
Rochester	26	15	5	3	2	0	0	1	0	0
Syracuse	20	18	0	1	1	0	0	0	0	0
Ithaca/Geneva	28	19	4	0	0	2	1	0	0	2
Albany	12	10	1	0	0	0	1	0	0	0
Long Island	6	6	0	0	0	0	0	0	0	0
NYC	0	0	0	0	0	0	0	0	0	0
Totals	112	84	12	4	3	3	2	1	1	2
Percent	100%	75%	11%	4%	3%	3%	2%	1%	1%	2%

Figure 15: Alumni Teams Dead or Alive

Stepping back from the data and combining the numbers in a slightly different way, we learn that: 97 (or 88%) of our alumni companies (or technologies) are either still operational in or out of state, were acquired, merged, or resulted in a new product or license. These are all very positive outcomes.

We could even add to that an interesting story of one of our idea champions who came in with a start-up that had been struggling for a while. He felt so strongly that the new business plan developed by his workshop team was on-target, that when he presented it to the CEO after the workshop and the CEO decided to "stay the course" rather than implement the new plan, our idea champion decided to amicably part ways with the company and start a new venture. While not a typical outcome, we have added another entrepreneur to the community and this is arguably a positive outcome as well.

VIII. Quantifying the Cost

PSWs highly leverage a community's entrepreneurial resources. Over the last six years, 34 workshops have been completed with under $700K in cash, matched with over $3M in in-kind services from public and private sources.

Each workshop costs around $20K and we have completed 34. That totals about $680K in actual cash dollars over six years.

But there's an enormous amount contributed in-kind. On average, between 40-50 high-level professionals volunteer their time for each workshop. Below, we have quantified the amount of in-kind community support brought to bear for each team. If we assume that each team member "billed out" for about 25 hours of effort (over 2½ days and the week in-between), then in-kind support is quantified as follows:

Team Members	Hourly Rate	In-Kind Contribution
Attorney	$300	$7,500
Coach	$125	$3,125
Professional 1	$75	$1,875
Professional 2	$75	$1,875
MBA Student	$25	$625
Total per Team		$15,000

In-Kind Contribution per Team

Each tech transfer office or university department paying $1500 per team, receives about $15,000 worth of in-kind labor per team, a 10:1 leverage. An industry sector paying a scholarship valued at $3000 per team, receives a community match of in-kind services valued at 5:1.

The in-kind value for the entire workshop depends, of course, on the specific number of teams. Generally we have between 5-8 teams. So, as shown to the right, if sponsors invest $20K per workshop, their investment is matched 4-6 X with in-kind support from the community.

No. of Teams	In-Kind Contribution
5	$75,000
6	**$90,000**
7	$105,000
8	$120,000

In-Kind Contribution per Workshop

Applying an average in-kind contribution of $15K per team to the 203 teams that have gone through the workshop, gives us a total of about $3,045K contributed in-kind over six years.

All told, here is the estimate for cash and in-kind sponsorship for the PSW.

	Six Year Total	
Cash Sponsorship	$680,000	18%
In-Kind Sponsorship	$3,045,000	82%
	$3,725,000	100%

Total Sponsorship over Six Years

While success has many fathers, it is reasonable to say that the PSW has played a significant role in starting 112 companies across NYS over the past 6 years. The PSW-role came with a cash cost of about $6000 per company-start which includes first-time and follow-on entrepreneurial education for many of the nearly 1300 participants, plus significant networking benefits for the community.

IX. Summary

The demographic data presented in this paper is summarize below:

Basic Metrics. 34 workshops have been held with 1283 participants staffing 203 teams. Of those teams, 91 (or 45%) did not result in a legally incorporated company. Possibly the technology or business concept is still being advanced but there is currently no legal entity. However, 112 (or 55%) did result in an "alumni company". This is a very high success ratio for research trying to emerge from the laboratory. We estimate based on on-line survey data that about half of those (56) legally incorporated prior to the PSW and participated because they did not have a solid commercialization plan or felt it was time to "re-assess" it. The other half of our alumni companies (56) made the decision to legally incorporate after the PSW.

Industry Sector Representation. 27% of the participating teams were investigating a new biotech opportunity. About 21% were energy-related. Another 14% were medical device teams. Software and IT combined were about 18% of the teams. Electronics & instrumentation was also a strong category. In Ithaca/Geneva, Buffalo, and Long Island, a majority of the teams seem to be focused on biotech. In Syracuse, the emphasis is on energy. Rochester appears to have a concentration in medical devices and software.

University, Corporate, and Community Participation Levels. 84% (171) of our teams had a university-affiliation -- 80% (163) of our teams were from local research universities or centers and 4% (8) of our teams were "cross-pollinated" from universities in other regions. 1% (2) of our teams were from large corporations, and 15% (30) were from the local community or small companies. The largest research universities in NYS are the most active in the PSW. Cornell topped the list, followed by U of Rochester, Stony Brook U, U Buffalo, Syracuse U, etc.

Alumni Company Affiliations. The industry representation of the alumni companies nearly matches that of the teams although there is a slightly higher percentage of software companies that launched relative to the number of teams likely due to lower risks and costs. Cornell has the largest number of PSW alumni companies by far compared to any other university in the PSW footprint.

Where Are They Now? 97 (or 88%) of our alumni companies (or technologies) are either still operational in or out of state, were acquired, merged, or resulted in a new product or license.

These are all very positive outcomes.

X. Conclusions

Between September 2004 and June 2010, we helped 203 teams determine the commercial merit of their idea and assess their start-up fortitude. The result is 112 Alumni companies (and some very wise decisions not to start a company). 97 of our alumni companies (or technologies) are either still operational in or out of state, were acquired, merged, or resulted in a new product or

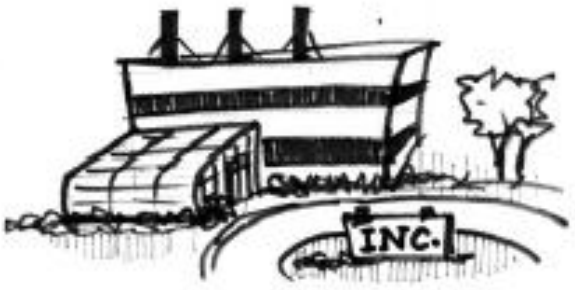
license. 84 are still pushing ahead as start-up companies here in New York State.

For New York State, that means that there are 84 high-tech start-ups that now exist that may or may not be in existence if it wasn't for the PSW and the work of all our volunteers and participants. Possibly some would have eventually formed anyway on their own or through other community programs, but we can likewise assume that some would not have.

And yet, we have not fully told the story about outcomes for these companies. How much follow-on funding have they received, how many jobs were created, how much revenue have these companies generated? There are also many "softer" metrics to report regarding the impact that the PSW has had on developing the entrepreneurial culture within a community. Data to determine these metrics were gathered through an on-line survey and the story of these outcome measures is told in Part III of this white paper series.

Part III: Progress Metrics for Alumni Companies

TABLE OF CONTENTS



I. Introduction

The Pre-Seed Workshop (PSW) is a two and a half day "build-a-company" community event *for high-tech ideas that think they may want to become start-up companies*™. Though its Idea Thickening® curriculum could be applied to any type of idea, it has been customized to focus on "high-tech". It is designed to provide communities with a robust, high-level, quick-screen mechanism to evaluate the commercial potential of inventions being developed in their regions.

This paper is part of a three-part series on the PSW analyzing six years of data from 2004 to 2010. Part I of the series provides a qualitative story about the history of the PSW, its fundamental purpose, and its foundational curricular philosophies. In Part II, we quantified the demographic data around the 34 workshops that were held during those six years including location of the workshops, the total attendees, number of teams, and how many of those teams turned into companies. Among other results, we determined that over the past six year, 203 PSW teams have created 112 companies. "A company" was counted "as a company" if a legal entity was formed. The determination was made based primarily on direct knowledge and conversations with PSW alumni and Host City Coordinators and supported with results from an on-line survey.

The purpose of this document, Part III, is to follow-up with the teams and the companies formed and report out on their successes post-workshop. The question we wanted to answer was "How are they doing now?" Forming a legal entity is a major milestone, but is no indication of the "health" of the company. Also, what about the other 91 teams? What happened to them?

So, a pool of 203 teams was studied. The data for Part III was again garnered from two sources. However this time the data resulted primarily from an on-line survey, supported by direct knowledge and conversations. As is typical, one-hundred percent sampling of the survey was not obtained. An estimate of the total impact across the entire PSW pool was obtained by multiplying the actual percentage of the sample pool by the total number of ideas (n=203) that have gone through the workshop.

The data tables, graphs, and charts included here are mainly for our Host-City Coordinators and other sponsors who integrate the PSW program into their communities. But the data has already proved interesting to many who care about the economic health in their regions and want to proactively improve the odds for struggling high-tech ideas from their very earliest beginnings.

II. Starting Motivation and Current Status

Before analyzing outcome metrics for the 203 teams, it might behoove us to capture why "Idea Champions"[1] elected to participate in the PSW in the first place. The online survey included that question and the results are as follows:

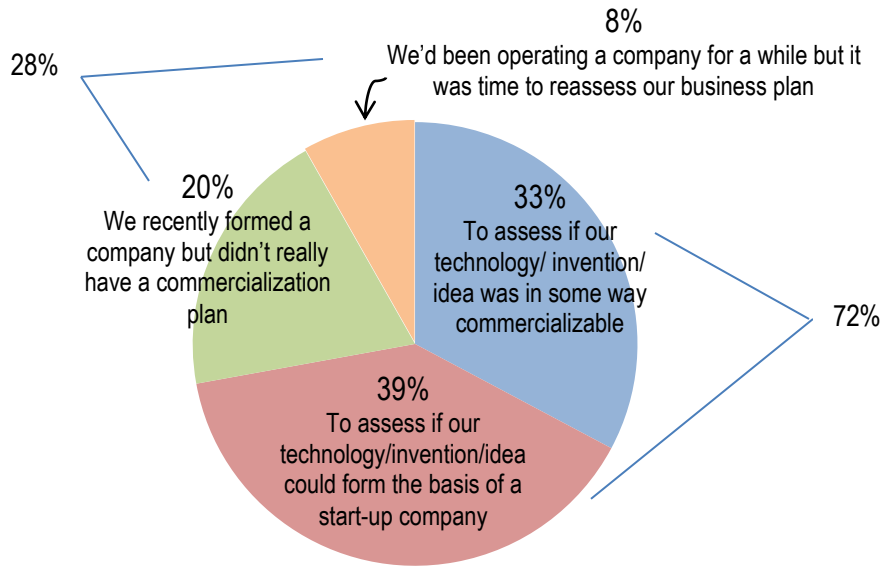


Figure 1: Why Teams Participate in PSW

It appears that about 28% of our idea champions legally incorporated a company *before* the PSW but participated because they didn't really have a commercialization plan or they felt it was time to "re-assess" it. 72% of our idea champions wanted to assess if they could either commercialize their technology and/or start a company … So, what did they decide?

Based on first-hand knowledge and survey results, we determined that of those 72%, 28% decided to legally incorporate *after* the PSW and 45% made the decision not to move forward as a legal entity (some never, some not yet). Figure 2 summarizes these findings.

Based on Best Knowledge and SurveyMonkey	Estimate		% of all Teams
Number of Teams legally incorporated as Company prior to PSW	56	112	28%
Number of Teams legally incorporating a Company after the PSW	56		28%
Teams that did not legally incorporate	91		45%
Total Number of Teams	203		100%

Figure 2: Incorporation Before or After

So, at this point, we know that of the 203 teams participating in the PSW, 112 companies legally incorporated and 91 did not form companies.

[1] An "idea champion" is the first critical member of a PSW team. S/he is the main driver of the commercialization concept. Most often, but not always, the idea champion is the inventor of the technology or business concept under investigation.

III. Stages of Development

The 112 alumni companies were formed over a period of six years. By and large, all started at the "pre-seed" stage and those resulting from the most recent PSWs are still "pre-seed". But for those companies that participated in workshops in the earlier years, we are seeing a natural progression of maturity. Figure 3 indicates the current stages of development of PSW alumni companies based upon each Idea Champion's own declaration in the survey and research by the authors.

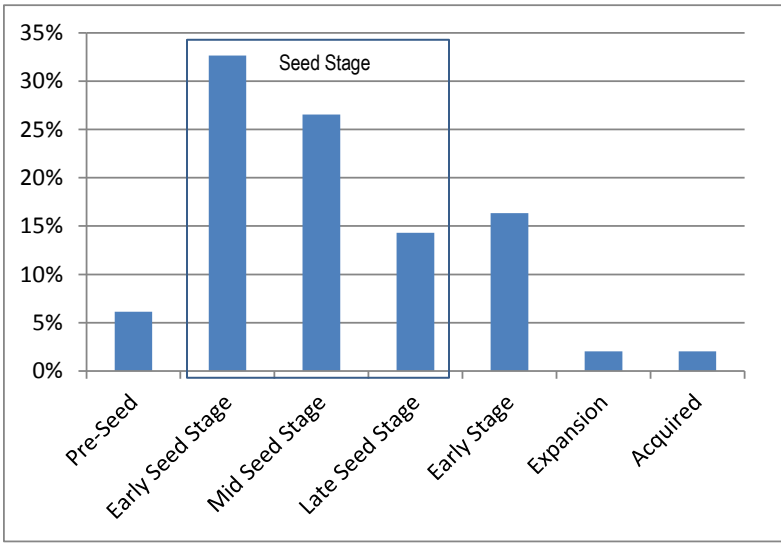


Figure 3: Stage of Development

As expected, companies are spreading out along the continuum of stages. Two of our 112 alumni have already been acquired! 75% are now within the realm of the seed stage (early seed, mid seed, and late seed), in accordance with the basic definitions below:

Pre-Seed Stage	Seed Stage			Early Stage	Expansion Stage
	Early-Seed	***Mid-Seed***	***Late-Seed***		
Refining and shaping what the product and company should be and how to get there.	Patents Business Plan	Employees Funding	Prototypes Beta-customers	Sales Earnings	Positive Cash Flow

IV. Measurable and Meaningful Metrics

Starting a new company is a milestone to be celebrated along the road to technology commercialization. Counting and tracking the number of startups is a critical activity for regional economic development. But when does a high tech startup company become a high-tech startup company? The simple answer is, "the moment they are legally incorporated" -- and that

is the definition that we have used in our studies. But this is far from a sufficient metric. Many high tech opportunities achieve major milestones before they become a legal entity. Conversely, some legally incorporated companies progress little beyond incorporation. It is essential to track the "health" of these embryonic companies, based on a set of measurable and meaningful progress metrics.

When does a high-tech startup company become a high-tech startup company?

Progress during the very early years of technology commercialization cannot be measured with traditional factors like jobs created, annual revenues, or facility square-footage. In the early years, employees consist of founders and volunteer working out of homes, coffee shops, and small borrowed spaces. It may be a few years from the point of "inception" to the day the company starts selling their first product. For an extended period of time, profits are measured with red brackets around them—the average high-tech scalable business accrues a few to several million dollars in losses before break-even.

Hence the pre-seed stage requires a set of metrics different than those of a mature business. While no perfect set of metrics exists, Figure 4 suggests a set of 14 progress milestones that are meaningful for companies in their earliest phases of maturity. They are listed in the approximate order in which they occur. Not all companies must achieve, and not all companies successful or failed, have passed through these metrics. Some metrics may even be achieved before a company is a legal entity. However, all these metrics are easily measurable; most having "Yes/No" and quantifiable answers that can be audited.

Earliest Maturity Progress Metrics
Business Milestones
1. ✓ Form a legal entity
2. ✓ Complete a patent licensing contract
3. ✓ Create a business plan
4. ✓ Participate in Local and Regional Events
5. ✓ Formalize local support relationships
6. ✓ Establish physical occupancy
Funding Milestones
7. ✓ Obtain grant funding
8. ✓ Invest Personal monies
9. ✓ Receive Family and Friends funding
10. ✓ Receive Angel funding or Seed funding from Professional Entity
11. ✓ Receive VC funding
Staffing & Revenue Milestones
12. ✓ Hire part-time employees
13. ✓ Hire full-time employees
14. ✓ Begin selling first product or services

Figure 4: Meaningful and Measurable Progress Metrics

In the table above, the progress metrics have been divided into three categories related to business milestones, funding, and staffing & revenues. In the sections which follow, survey results are reported out by category. Note that our on-line survey achieved a 35% return rate. So, from this point on, we will be using this set of returns as a representative sample set and for the most part reporting out metric results in percentages rather than as number counts.

V. Business Milestones Achieved

Patents and Licensing Contracts. Since the PSW is focused on high-tech, the majority of ideas entering the PSW are based on patented or patentable technologies. We asked our alumni, "Do you have either an issued or pending patent(s) on your technology/invention?" 75% of our companies said that a patent is either issued, pending, or that they plan to start the process. Only 25% said that their invention is not patentable. 70% were in discussions, or had already reached a licensing agreement, with their university-based Tech Transfer Office (metric #2).

Next Steps. In terms of next steps, we asked our companies the questions below:

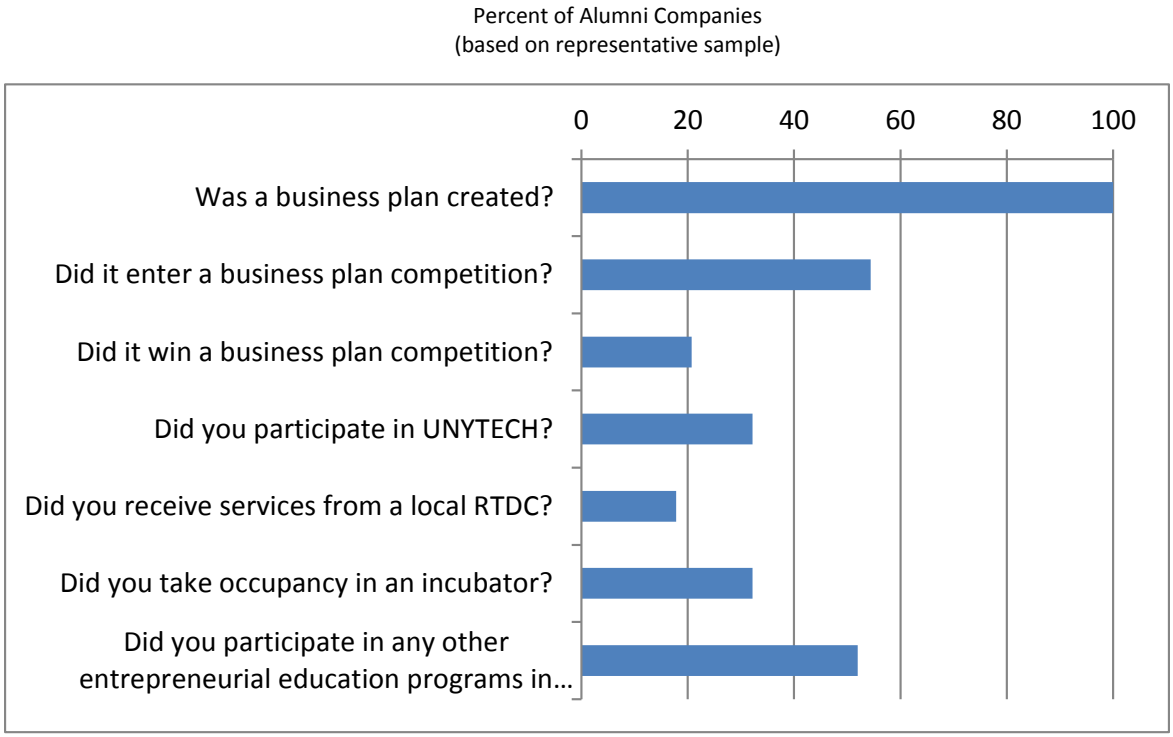


Figure 5: Business Milestones Achieved by Alumni Companies

We found that all of our sample set companies created a business plan (metric #3). More than half entered business plan competitions and about 20% actually won those competitions (which means that 40% of those entering competitions actually won them!) About a third of our companies participated in UNYTECH (a venture forum in NYS for seed and early stage

companies) and over half of our companies went on to participate in other entrepreneurial education programs (metric #4). A third took occupancy in a local incubator (metric #6).

We're basically pleased with these results as indicators that our alumni companies are moving forward and making progress. Also, the results show that one of the primary objectives of the PSW is being met, i.e., to connect our alumni with other services and programs in their community. Post-PSW, we encourage participation in business plan competitions, venture forums, educational programs at local incubators, etc. We see the PSW as a "feeder system" into the various resources that our host communities and states already have in place. We believe that there is still room for improvement in developing better community integration.

VI. Funding Received

Metrics #7-11. In terms of funding, we asked our companies questions related to the sources and amounts of funding that are indicated in Figure 6 below:

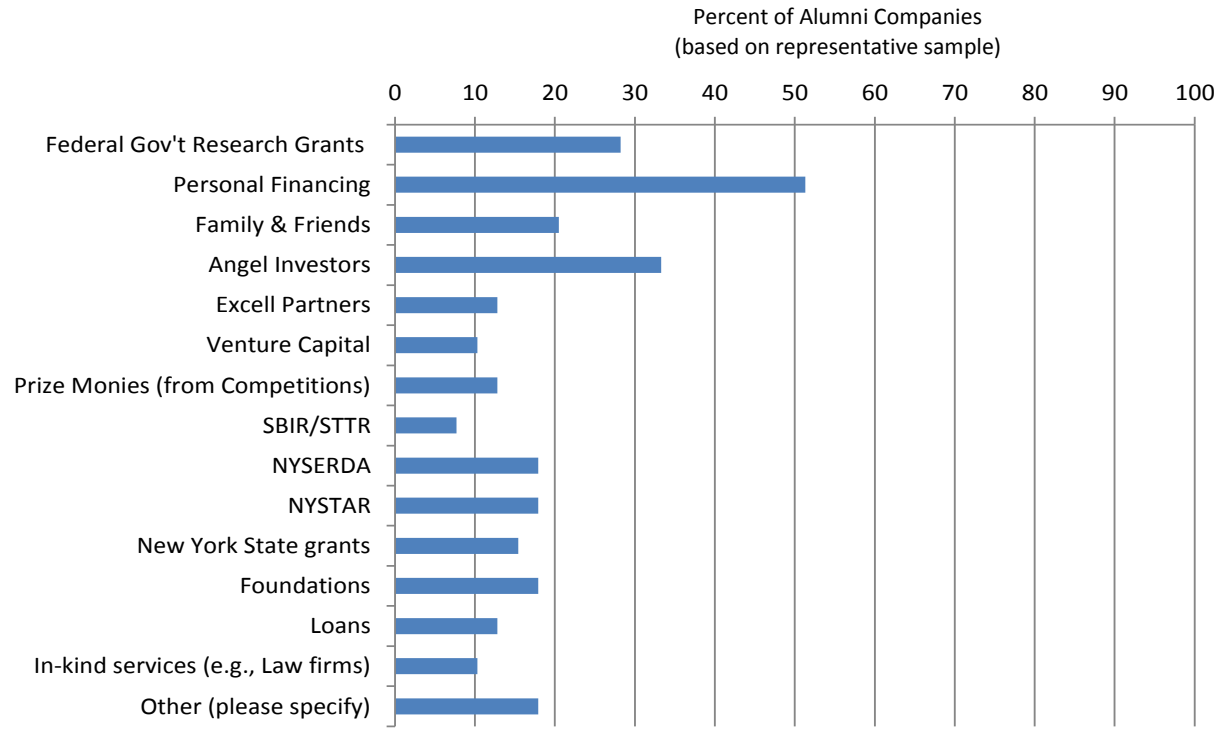


Figure 6: Funding Secured by Alumni Companies (Percentages)

The figure above tells us that about 28% of our companies have received grants from the federal government. 51% have used personal financing. 21% have tapped into family and friends. 35% have received Angel funding. 12% received Excell Funding. And 10% have received venture capital.

13% of our companies have secured prize monies by winning business plan competitions. Some have won SBIR grants, although our anecdotal reports exceed our survey numbers. 21% of our

companies are energy-related and most of them have won NYSERDA grants. NYSTAR and other NYS grants, foundation dollars, and bank loans have also provided cash to many of our companies.

The bottom line is that, at their early stage of development, these companies are leaving no stone unturned. It appears that every possible source of capital is being used by these companies to get through the Valley of Death. In our on-line survey, we asked our companies what their "biggest challenge" was and 50% said "funding".

In terms of amount of funding, here are our estimates:

Sources of Funding	Actual Amounts from Sample Set ($000)	Estimate of Total ($000)
Federal and State Grants		
Federal Gov't Research Grants	$4,550	$13,075
NYSERDA	$927	$2,664
SBIR/STTR	$760	$2,184
Foundations	$509	$1,463
NYSTAR	$449	$1,290
Other NYS grants	$273	$784
total	***$7,468***	***$21,460***
Private Equity		
Personal Financing	$1,074	$3,086
Family & Friends	$1,521	$4,371
Angel Investors	$5,970	$17,155
Excell Partners	$470	$1,351
Venture Capital	$1,750	$5,029
total	***$10,785***	***$30,991***
Loans, Prizes, and Other		
Loans	$315	$905
Prize Monies (from Competitions)	$265	$761
In-kind services (e.g., Law firms)	$30	$86
Other	$603	$1,733
total	***$1,213***	***$3,486***
Grand Total	***$19,466***	***$55,937***
Average per Company	***$499***	***$499***

Figure 7: Funding Secured by Alumni Companies (Amounts)

Based on best estimate from our sample set, it appears that since the PSW, our alumni companies have raised about $21M in grant funding and $31M in personal and private equity. Along with another $4M in "miscellaneous" sources of funding, the total received was about $56M.

It is very interesting that this averages out to almost exactly $500K per company. In today's climate, the average amount of funding needed for a Seed Stage company is $500K (this is validated in many VC blogs, e.g., http://jordancooper.wordpress.com/2011/01/12/seed-stage-valuation-guide/). Our alumni companies are hitting that target spot-on.

Keep in mind that this is only the beginning for these companies. Many of them will need to raise several millions more in early stage, expansion stage, and later stage financing. But it is reassuring to see that they are off to a good start.

VII. Staffing, Jobs & Revenues

Staffing. The second biggest challenge noted by our companies, after funding, was finding experienced and talented managers that can move the company forward. As shown in the graph below, 100% of our companies have a CEO. 41% have a CTO or CSO. 28% have a VP of business development. Around 25% have a Scientific Advisory Board, a Board of Directors, and Patent Counsel. Nearly 40% have "other" team members and we assume these are primarily technicians. Only a few have a COO or a CFO.

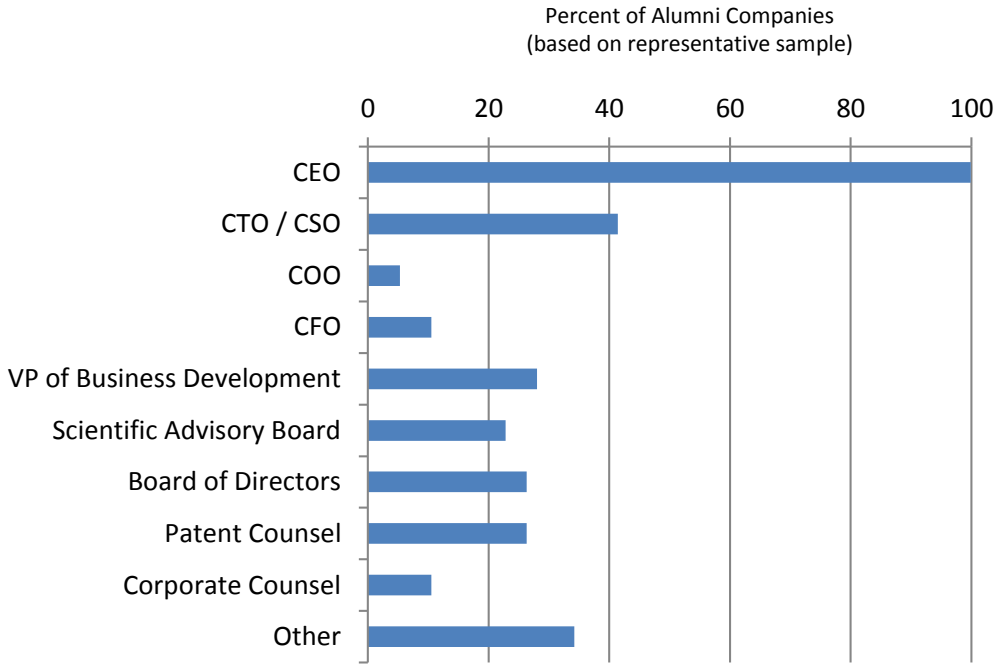


Figure 8: Executive Managers Secured by Alumni Companies

While we don't have specific data to validate this, we strongly suspect that some of those CEOs are actually scientists that are acting as CEOs by default. If they could find other managers, they would likely assume the CTO or CSO position.

In response to the question, “Are any members of your company contacts you made through PSW?” 16% said yes. In response to the question, “To what extent have contacts formed through participation in the PSW proved useful?”, 88% said that the contacts they made were anywhere from “somewhat” to “extremely useful”

Jobs Created. So, what does this mean to the community in terms of jobs created? Again, based on actual data from our sample set, we have developed the estimates shown in Figure 9. In total, our companies have created an estimated 356 jobs. This is about 3 jobs per company. This makes perfect sense given the embryonic stages of alumni company development. As these companies grow, we can actually expect that some will collapse, some will become life style businesses, some will become mid-sized companies, and a select few might eventually become major employers.

Number of Employees	Actual Amounts from Sample Set ($K)	Estimate of Total
Full-time inside NYS	62	178
Part-time inside NYS	56	161
Full-time outside NYS	4	11
Part-time outside NYS	2	6
Total	124	356
Average per Company	3	3

Figure 9: Jobs Created by Alumni Companies

Revenues. Are any of these companies already selling product?

Year	Actual Amounts from Sample Set	Estimate of Total
2005	$0	$0
2006	$0	$0
2007	$5,000	$14,368
2008	$38,500	$110,632
2009	$258,000	$741,379
2010	$1,600,501	$4,599,141
Total	$1,902,001	$5,465,520
Per Company	$48,799	$48,799

Figure 10: Revenues Generated by Alumni Companies

Our actual sample set and estimates are shown in Figure 10. We would expect that most companies are generating $0 revenues. However, some of our alumni companies were formed in 2005-2007, and they may have reached a stage of maturity that they are indeed generating modest revenues. Averaged over the entire sample pool, the revenues per company are $50K which is very consistent with expectations.

VIII. "No" Decisions

Of the 203 ideas that have gone through the PSW, we know that 91 did not form legal entities (although some may in the future). What happened to those ideas and their Idea Champions? Our survey didn't probe down that avenue very deeply. However, we do have a fair amount of first-hand knowledge given conversations with alumni and their Host City Coordinators.

We do know that many ideas go "back to the lab". Some of our teams realized that the technology wasn't sufficiently developed yet to serve as the basis of a company. Also, many idea champions realized that they personally were not ready for the start-up journey. For some, the timing wasn't right and for others the "start-up life" was simply too far outside of their comfort zone. Some chose to wait until they had a team behind them to advance the idea or move it forward on their behalf. Some chose to advance their ideas under the radar, slowly making progress, sometimes for years. And then, as always, there were some technologies that were simply better suited as licensing opportunities rather than as start-up companies.

All of these are acceptable outcomes. The PSW is intended, not to push idea champions towards a "yes decision", but rather to explore whether a "yes" or a "no" is the right answer.

IX. Personal Impact

In our on-line survey, we asked the question, "To what extent did PSW participation have a positive impact on your entrepreneurial perspective?" As shown below, about 80% of our participants indicated that it had either a "positive" or "significantly positive" impact. And for those who realized that they didn't want to be an entrepreneur, we consider that a win as well.

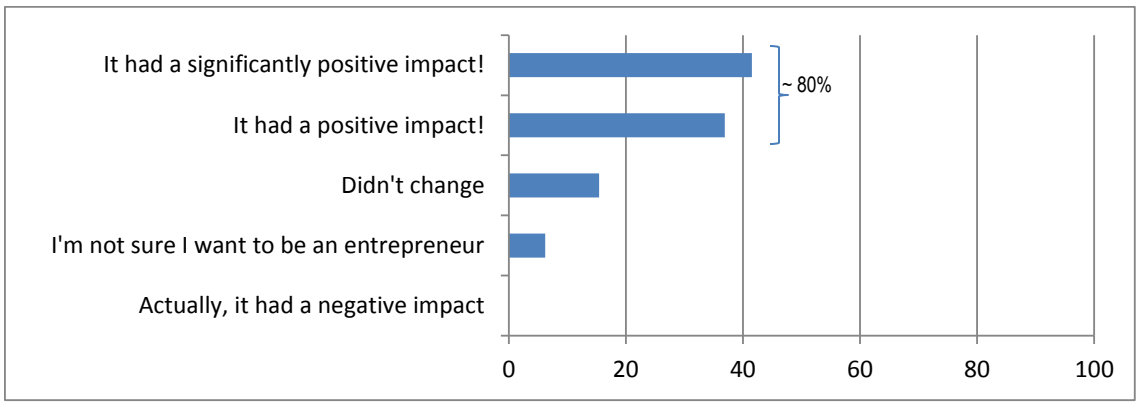


Figure 11: Emotional Impact of PSW

But we are probably most proud of the following metric. We asked, "Would you recommend the PSW to other researchers?" 100% of our respondents said yes. It's pretty rare to get 100% of survey respondents to answer affirmatively to any question. So, we're especially pleased with this result.

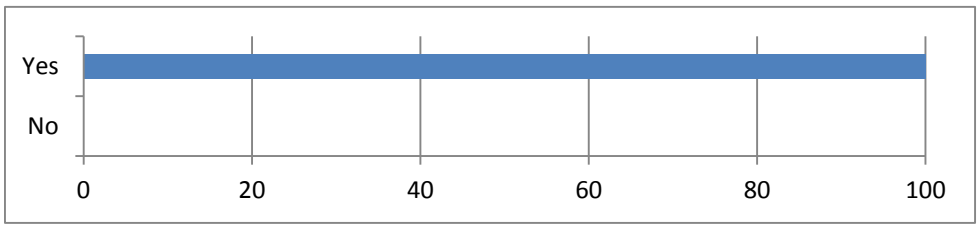


Figure 12: "Recommendability" of the PSW

X. Conclusions

Tracking the progress or success of established companies is a well-studied science. However, tracking progress at the earliest stages of a company's formation and development is far less studied. Regions interested in advancing startup companies should be tracking pre-seed and seed stage companies and bolstering their idea pipelines.

A simple listing of 14 progress milestones was presented herein as a preliminary framework for tracking and benchmarking ideas from their inception. Using this framework, a pool of 203 high-technology ideas, spanning six years and originating primarily from New York State research universites, was analyzed. These Idea-Champions have created 112 companies, received an estimated $21 million in associated grant funding, obtained $35 million from private equity and other sources, and based on best-knowledge have created over 350 jobs in New York State

Rather than an end in itself, the data presented herein is seen as a starting point. It is hoped that far more tracking occurs over the years and improved study and modeling is launched in the area of pre-seed maturity.

PSW Six-Year Study "Trilogy": Overall Conclusions

The primary objective of the Pre-Seed Workshop is to help potential entrepreneurs move off the point of indecision, by

- determining the commercial merit of an idea,
- assessing the team's start-up fortitude, and
- for those ideas that do have commercial merit, organizing the idea to move forward.

Between September 2004 and June 2010, the PSW helped 203 high-tech teams do just that. The result is 112 Alumni companies (and some very wise decisions not to start a company). 97 of our alumni companies (or technologies) are either still operational in or out of state, were acquired, merged, or resulted in a new product or license. 84 are still pushing ahead as start-up companies here in New York State.

Since their PSW experience, alumni companies have raised an estimated $21 million in associated grant funding, obtained $35 million from private equity and other sources, and based on best-knowledge have created over 350 jobs in New York State with the potential to create many more.

By any measure, we can conclude that the PSW is a very effective program.

However, the work is not done. We have built the PSW as one front-end component of the entrepreneurial ecosystem. But it is essential that our alumni are feed into a supportive pipeline. We encourage all of our community stakeholders to support the entire commercialization continuum and ensure that it is in-place and healthy.

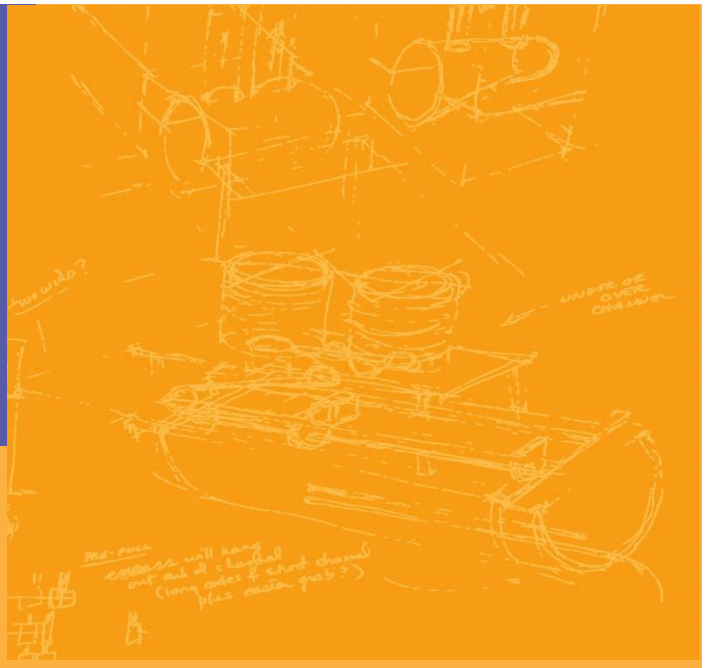
Our alumni companies will face many challenges along the entrepreneurial road. Right now, they are very early-stage, high-risk ventures. We do not expect that every one of them will succeed long-term. Some will die, some will become life style companies and a few will "hit big". Those that "hit big" in NYS (along with the life style businesses) could potentially have a tremendous impact on our region's economy.

To our 84 alumni companies that are still pushing forward in NYS: Good luck and much success as you press on with your dreams.

"Don't let the noise of other's opinions drown out your own inner voice …
have the courage to follow your heart and intuition."

Steve Jobs, co-founder of Apple and Pixar

And for the PSW team at "headquarters", we feel that much work remains to be done to leverage the more than $50B that the federal government spends every year on university-based R&D. We're still looking at the tip of the iceberg. However, since the writing of the "PSW trilogy" began, the PSW has been expanding nationally. As founders of the PSW, the words of Steve Jobs inspire us as well.



The Pre-Seed Workshop
is a product of:

NEWORKS

HIGH-INTENSITY
TECHNOLOGY COMMERCIALIZATION