Master Programme in Entrepreneurship

Entrepreneurial Project
BUSP01
Taras Seryy

Course Submissions
Section A - Business Plan
Section B - Theoretical Reflection

Section A - Business Plan

eTrap

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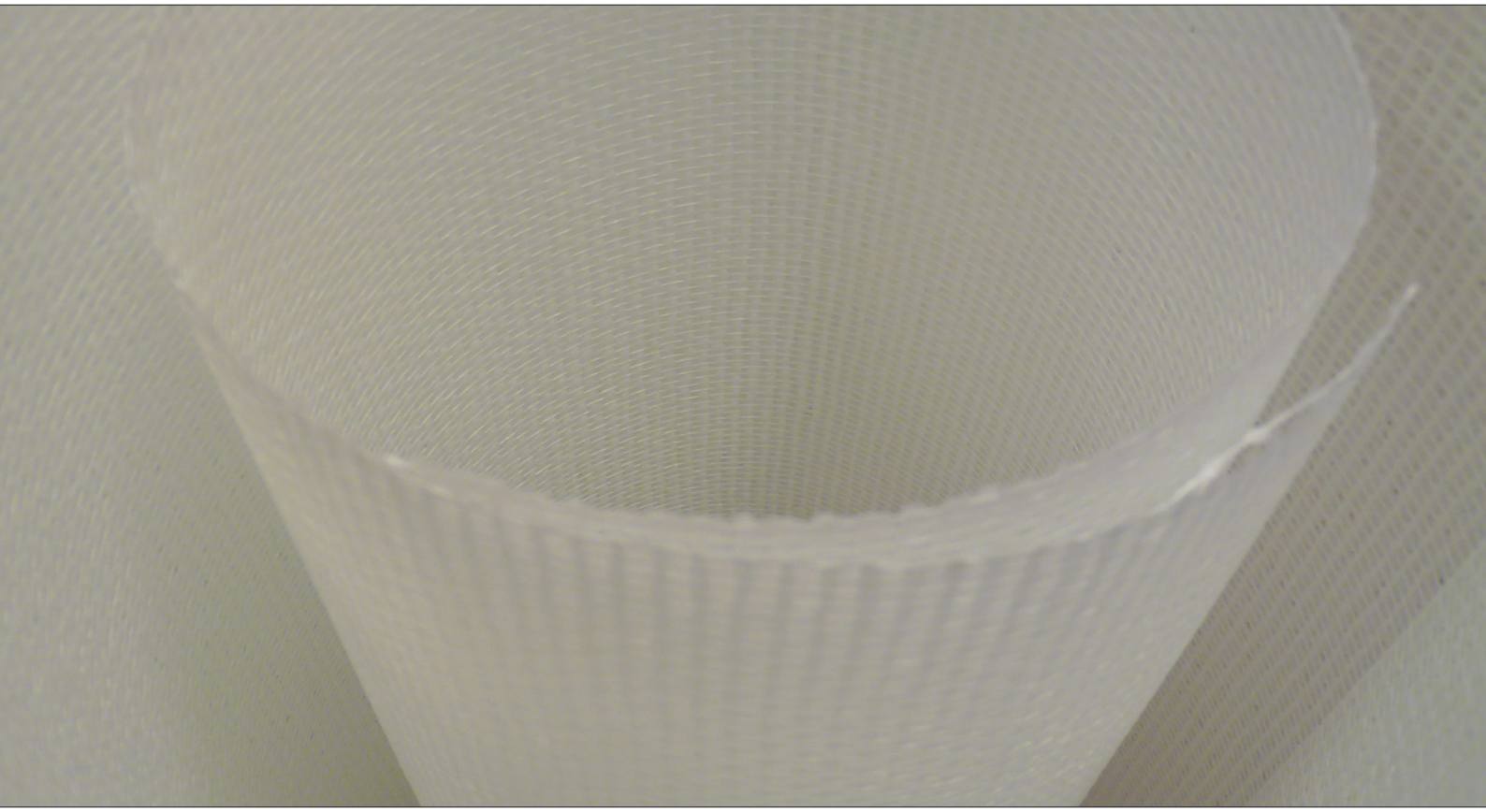
Business Plan

BUSP 01

May 6, 2011



A project within the Master Course in Entrepreneurship at Lund University, Sweden.

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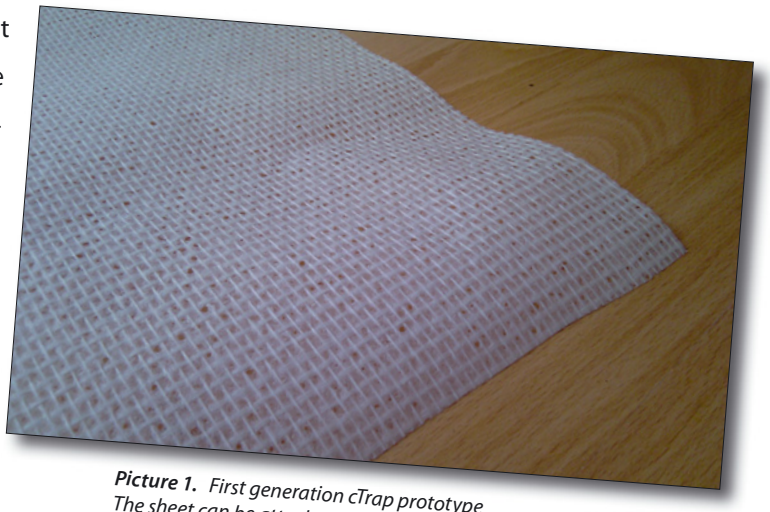
Summary

Water-damage of buildings is common all over the world due to various causes such as natural disasters, poor construction methods and inadequate construction design. Indoor dampness is related to adverse health effects: 1,2 million of Sweden's population have respiratory problems due to the bad quality of indoor air.[1] Getting compensation for water damages from the insurance companies is not always easy. Sometimes owners resort to judicial litigation which is time consuming. The water damage and other toxic emissions from walls and construction materials are referred to as the Sick Building Syndrome (SBS).

The invention is an adsorbing sheet (surface filter) that stops harmful emissions caused by the water-damage from spreading in the building. The product is applied on the surfaces subject to water-damage (walls, floors, ceilings indoors; frame etc). This means that people can in some cases stay in their home during remediation (they don't have to move to a hotel for example).



Picture 1. *First generation cTrap prototype*
The sheet can be attached to any surface with tape or nails.

The cTrap is a patent pending research project that is in the stage of final product development. The initial laboratory tests, conducted at Lund University, have shown an immediate reduction in emissions at the source from samples that were covered by the prototype materials.

Customer Benefit

The water-damage remediation standard covering Australia, Canada, Ireland, Japan, New Zealand, UK, and USA (ANSI / IICRC S500) states that: "Mitigation is the control of the spread of contaminants: In some water damage situations, such as those involving sewage, microbes present can include a variety of disease-causing human viruses and parasites, in addition to bacteria and fungi. When waterborne contaminants (fungal, bacterial, viral, algae) are present in the building environment, they can become airborne during the drying process and spread to previously unaffected areas within the structure. Contamination should be contained as close to its source as possible."[2] cTrap assists the water-damage remediation professionals in performing mitigation activities.

Case a: To eliminate mold and other bacterial contamination, specialists use chemicals known as biocides. "Biocides, which can be strong irritants or sensitizers, might not be appropriate for application in close proximity to building occupants who could be exposed and adversely affected. Finally, products with strong odors can be undesirable to some customers or occupants as many individuals suffer from asthma, allergies, or other conditions that can be exacerbated by the application of antimicrobials (biocides). "[3] These biocide chemicals include but are not limited to quaternary ammo-

nium compounds, phenolics, iodophors, glutaraldehyde. By applying the cTrap emission trap over the surfaces coated by biocides, the potential hazards to the occupants are virtually eliminated.

Case b: In order to effectively dry the building, water-damage professionals use air-moving equipment to dry-out affected surfaces. "Airmoving devices inherently tend to aerosolize soils and contaminants present in the environment. As water evaporates from surfaces and materials, such as floors and walls, more particles often become aerosolized, creating possible health, safety, comfort and cleanliness issues."[4] To minimize or control aerosolization of particles restorers can use cTrap in the final stages of drying to act as a filter or scrubber. Internal testing has shown that when used on surfaces with light water saturation (less than 25% above the normal humidity levels) application of cTrap over the surface does not increase drying time.

Case c: Under certain circumstances the use of air-moving equipment is not possible/advisable, in these cases cTrap combined with dehumidifiers can produce an effective drying solution.[5]

After a consultation and preliminary evaluation of cTrap material by SP Technical Research Institute of Sweden in December 2010 it was determined that:

Case d: The cTrap is effective as a temporary emission absorber from mold growth on concrete and brick surfaces, and shall be used to maintain occupancy of the mold contaminated structures until the appropriate remediation work may commence, and permit residency, as stated in case above, while the biocides are used to eradicate the mold colonies on the affected surfaces.

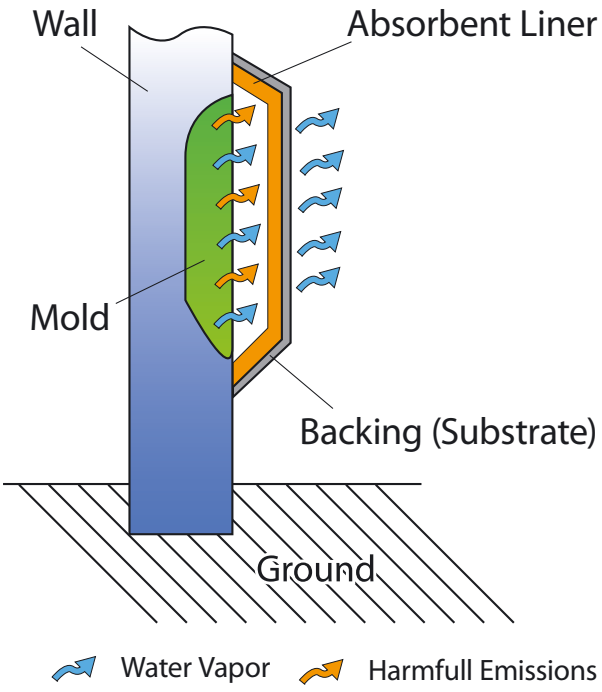


***Figure 1**. cTrap operating principle*

Due to a very specialized nature of the product and a niche market that it will occupy, combined with the simplicity of manufacturing, it was decided that the venture will undertake the research, manufacturing, and multinational export function. The majority of the market for cTrap is in North America and mainland Europe since the construction practices favor concrete and masonry buildings both in public and private sectors.

Following successful in-house testing and integration of cTrap into the standard remediation procedure by the standard setting bodies, the demand will grow exponentially into product maturity. The presence of cTrap on the markets of developed economies with a high rate of flooding and related disasters, the demand for cTrap will remain positive in the foreseeable future.

Marketing

Market Description

Our primary customers are firms specializing in water and mold damage remediation, which are required to trap the emissions from mold and other toxins from water-damaged surfaces in public buildings, houses and apartments worldwide. We are aiming at the commercial property remediation in the US, Canada, Australia, Japan, Europe and Sweden.

Hyresgästföreningen, the Swedish association of tenants, reports that tenant complaints concerning mold have been increasing. The complaints are filed against the landlord for delaying or not taking appropriate action to stop the mold or repair the building. Almost two to three cases are filed per week, and the resolution of disputes can take up to a year. Therefore, at least a temporary solution to SBS causing emissions is urgently required.[5] The use of our product allows the tenant to maintain healthy living environment while landlords prepare for the repairs.

There is a study of Uppsala University that point out that 4 of out 10 kindergartens have mould and bacteria.[6] By using cTrap on the appropriate surfaces, public buildings such as schools may not be required to close down for the fear of increased harmful emissions, if they have experienced mild water damage.

We aim at start the roll out of the product in the USA and Netherlands, with secondary market of Sweden, Italy, Germany and Japan. The CTO Lennart Larsson is active in international conferences with scientific researchers in the field of SBS, mold and water damage from the World Health Organization. Many prominent researchers in the field agree that cTrap is a very promising concept to trap toxic emissions.

Prospective Customers

After performing numerous cold calls to what we believed would be potential customers and getting sparse reaction, we have shifted our strategy and attempted to get the participation of the governing bodies that certify and dictate the water damage repair practices to the industry.

cTrap team visited SP Research institute and met with their mold and water damage repair specialists. The meeting was extremely productive as it highlighted many positive aspects about our product, but also showed areas of improvement that are being addressed by the development team. Once the initial product development will be complete at our laboratories, the project will be working closely with SP to independent validate our product effectiveness.

To evaluate the export potential for our product, the team is working with Restoration Industry Association (further RIA) and Institute of Inspection, Cleaning and Restoration Certification (further IICRC) of the USA. These two bodies effectively dictate the state of the restoration procedures for general contractors in the United States and other countries. The project has been in cooperation with the technical committees of these organizations, and has received numerous positive influences for the product development goals. In particular we have established great contacts within RIA and have developed a positive consulting relationship with one of the leading technical experts in the field of water-damage and mold remediation in North America. This

expert is a member of the standards committees for IICRC S500 and S520 standards, as well as the frequent publisher of industry technical bulletins and training information.

cTrap has received strong interest from a prospective customer in Netherlands, which specializes on manufacturing and distribution of mold control agents in Holland. They have verbally expressed their support for our project subject to final prototype performance testing.

Additionally the commercialization team of cTrap has been involved with tenant's association of Sweden and several insurance companies as to ascertain the applicability of the material for the end customer. The preemptive effects of toxin elimination from the air were well received, but in most cases to achieve the full benefits, the owner would require assistance from a professional firm, unless the mold is clearly exposed on a concrete or masonry wall, with no other material installed over that wall.

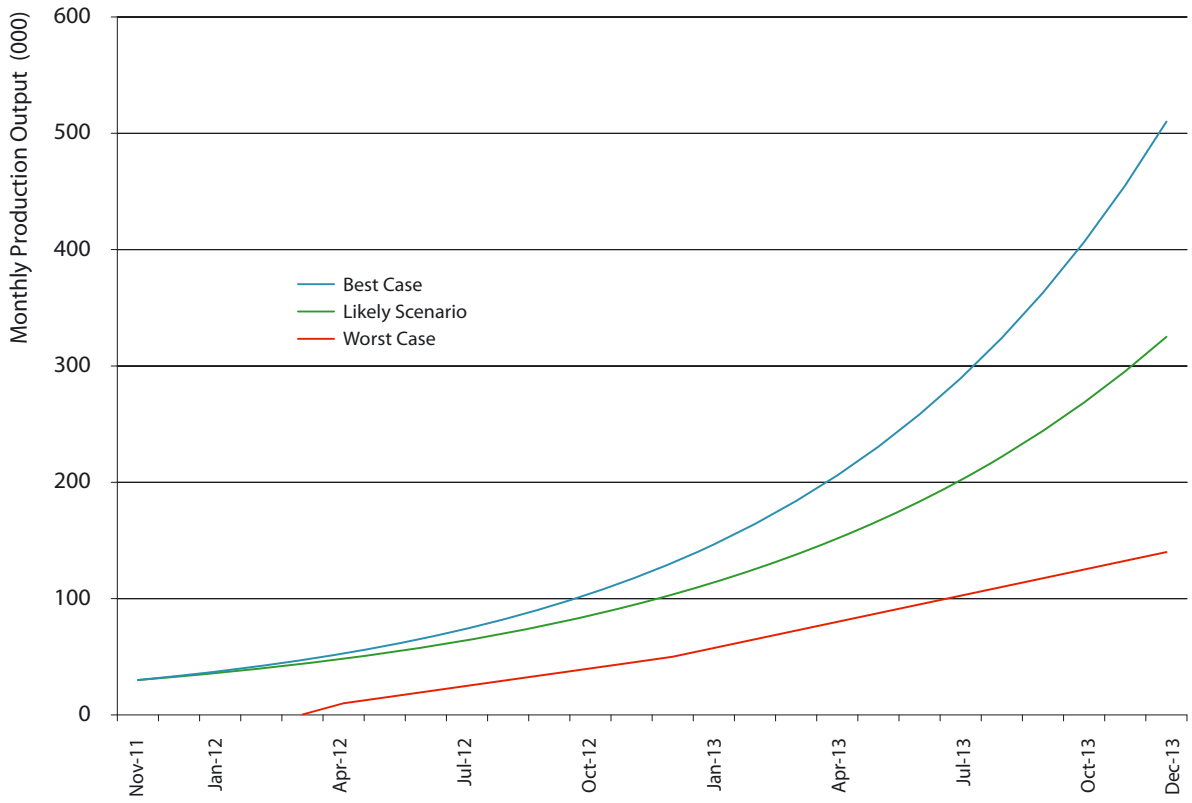


***Chart 1**. Demand forecast for cTrap*

According to the Harvard University study titled "The Remodeling Market in Transition Improving America's Housing 2009" the home improvement and remodeling market in 2007 the US was worth 326 billion USD with a growth rate of 15%. Of this aggregate 6% is spent on various types of disaster restoration projects ranging from floods to hurricane damage, which amounts to 19.2 billion USD.[7] After a more detailed analysis (see market strategy) and further research of the market we discovered that the development focus should shift to the multistory commercial structures, rather than residential construction. Based on the feedback from RIA we estimate the total market for US to be 3 500 000 m^2 per year of cTrap, with Canada, Australia and Japan accounting for another 2 800 000 m^2 per year. Holland's peak market estimate based on feedback is at 500 000 m^2 per year. Our estimate based on the feedback from our Swedish contacts shows the annual requirement of 100 000

m^2 per year in commercial applications. After the first year of production we estimate the annual consumption of 760 000 m^2 per year, with subsequent years gaining substantially towards the peak requirement.

Industry analysis

The restoration industry in USA is highly diverse with numerous small players operating the market, yet the industry is well organized and headed by the Restoration Industry Association that through Institute of Inspection, Cleaning and Restoration Certification controls the procedures used by contractors to perform water and mold damage remediation.

The Swedish market is dominated by three conglomerates that perform the majority of water and mold damage remediation.

Typical interaction of the property owners with the industry is through a final contractor, as very few individuals are capable of effectively addressing the issue by themselves due to numerous hazardous materials and other specialized chemical regulations that are required to perform the job safely and effectively. The contractors interact with the materials wholesaler or the materials manufacturer.

After a thorough review of the literature, numerous surveys and feedback from our prospective customers and partners, we have established the following value chain scheme with the materials accounting only for 20% of the total restoration value, with remainder being the labor cost of the contractor.

Our specialized expertise with the microbiology and chemistry, combined with strong manufacturing knowledge and simple product manufacturing/packaging process cTrap is best positioned to maintain the R&D and manufacturing functions, while working with country distributors to connect with the actual contractors performing the remediation procedures.

Given the specialized nature of our product and unique situations it addresses, we can expect moderate profit margins on the product itself, as well as offering commodity product margin to our country distributors.

Market Strategy

The motivation for shifting our focus from residential to commercial properties came from the cost-benefit analysis that the team performed during the initial financial planning stages. These assumptions were strongly supported by industry representatives and our prospective customers. The results of this analysis are shown in the Table 1 (page 8). The greatest benefit both for the cTrap project and end customers comes from effective application of cTrap in the commercial properties.

Because cTrap offers a unique emission entrapment proposition with a very specific application range, we are selecting premium pricing strategy that offers lower cost and greater customer benefit as compared to the costs and inconveniences of temporary relocation.

The greatest challenge before cTrap is indisputably proving the effectiveness of the material in its intended application and consequently obtaining the endorsement of RIA and IICRC. Given the preliminary testing results on previous generation of prototypes and positive feedback from RIA/IICRC, this task is manageable but will

Residential Case			Commercial Case		
Avg Basement Size USA	60	m^2	Affected damaged area	500	m^2
Avg water damage height	1	m	Avg water damage height	1	m
Perimeter length	32	m	Perimeter length	120	m
Total material requirement per job	92	m^2	Total material requirement per job	620	m^2
Total cost to produce cTrap for the Job	406	USD	Total cost to produce cTrap for the Job	2738	USD
Avg hotel stay in USA	103	USD/night	Office relocation expenses	1000	USD/day
Avg time to dry out difficult structures	7	days	Avg time to dry out difficult structures	10	days
Customer relocation cost	793	USD	Customer relocation cost	11000	USD
Possible economic rent	387	USD	Possible economic rent	8262	USD
Possible gross margin	95%		Possible gross margin	302%	

Table 1. *Price sensitivity analysis for cTrap*

take a certain amount of time. Additionally, during the re-issuance of the standards for water-damage and mold remediation, integration of the cTrap in the remediation procedure would secure the demand for the next several years.

The promotion for the product will be carried out through various scientific and industry conferences that are attended by our researcher. Given the industry structure this is the best method for convincing the scientific community developing the industry guidelines of the viability of our product. Since these conferences are attended by our researchers as part of their university programs, the project does not incur additional cost for participating in these events.

Once the product has been approved and integrated into the remediation guidelines the venture will undertake additional promotion strategies to speed up the adoption of the product. This step entails the participation in various industry trade shows. This action will require an annual investment of up to 2 million SEK.

Sustainable competitive advantage

Because of a unique niche for the product, regulatory guidelines and patent protection, the market is not attractive for competitors, and given a stable demand the position of the venture is secure within the foreseeable future. Yet growth is essential to successful survival of the venture. For this reason we intend to undertake product line expansion to serve additional market requirements for fire damage, heating oil contamination clean up, and other decontamination uses.

We are addressing an existing market with a new product and that's why we should be focused on product Development in the framework of Idea Generation, Validation, Concept Development, Pilot projects, Product Development and Marketing , Improving the product through the following practices:

Customer Focus ensures that the product development addresses customer needs and changes in those needs: [8]

- Quality is crucial to get a good reputation on the market, a good validation process with SP will ensure this.
- Supplier Focus is also important to make sure we have control over the suppliers we should also

integrate some of most important into the company. Aiming for a backward integration in the value chain.[9]

- Good Employee Practices are important to retain and attract the best and most qualified human resources.
- Innovation and Technology are the most important factors to take the lead and be a company that works on incremental improvements of the product line. Aiming for TQM practice and also incremental innovation processes.[10]
- Information and Benchmarking are also cornerstone to always be informed with the best intelligence available on the industry and the changes in the business environment. We have also to benchmark us in relation to competitors.

Environmental sustainability

Our environmental vision is based on the work of Schindehutte and follows the principle of People, Planet and Profit :

- The CTrap will have a sustainable vision to achieve the necessary certifications a safe workplace for People.
- Planet: Objective year 2 will be to achieve a (Miljödiplomering) Swedish diploma on for complying with sustainability and Good Manufacturing Practices. Ensure that at least 90% of our suppliers follow ISO norms and start our ISO certification process. Year 5 we aim to develop a comprehensive environmental audit system according to Global Reporting Initiative GRI norms as we grow internationally.[11, 12]
- Profit: cTrap R&D will stay on top on the idea generation process to innovate novel products that are not only high quality but also employing a cradle to cradle vision to minimize impact on the environment by using less energy and less materials saving both money and energy.[13]

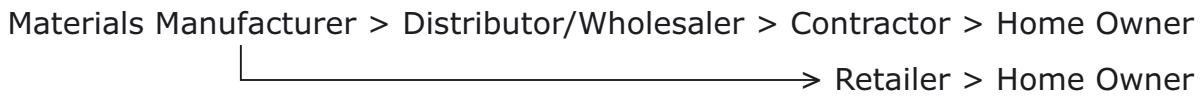


***Figure 2**. Restoration Materials Value Chain*

Business Model

After numerous debates and investigations, including a thorough value chain analysis (see Figure 2) the management team of cTrap settled on the manufacturer business model, as it allows for greater product and quality control, while capturing the greatest economic value from the activities. The manufacturer business model also allows for the greatest ROI and greater capital accumulation, as show by the research of Malone et. All.[14] The simplicity of product manufacturing, ready material availability and high degree of automation in the process make the manufacturing operation simple and inexpensive. Additionally a specialised niche market

makes it less attractive to large scale construction material players which precluded the licensing scenario as a primary option.

Therefore the key tasks of cTrap would be as follows:

- Product design and development
- Manufacturing
- Packaging and shipment to country distributors
- The final distribution will be performed by our country partners who are much more skilled in meeting the unique circumstances of their domestic market

The majority of the raw material supplies will come from EU, USA and China. We have received the quotes from our prototype material suppliers but are currently in evaluation of other suppliers who are closer geographically to our proposed Skåne manufacturing location.

Given the flexibility and light weight of the final product, the cTrap will be packaged in 100 m^2 flat rolls which will be assembled in to Euro-palettes and shipped either in container or "Less than Container Loads" (LCL) with ocean freight forwarders. Skåne manufacturing location allows for easy sea port access either through Malmö or Ystad. The venture also intends to leverage the Just-in-Time (JIT) inventory management techniques to reduce the inventory on-hand and warehousing requirement.

Organization

Management Team

René Churquina — has been working with business and market development in 14 start-ups in the last seven years and has a strong background in sales and public relations for technology based firms in IT and Cleantech. René has the ability to create new strategic partnerships, execute the market strategy, generate concrete sales and organize partnerships that lead to long term revenue. René is responsible for marketing and sustainability.

Taras Seryy — has over 10 years of experience in manufacturing, automotive and alternative energy segments, working as mechanical and production engineer, production manager, and proprietor, product developer, and consultant. He has over 6 years of eastern European marketing, publishing and advertisement experience. Taras is also experienced in residential and industrial construction. Has excellent knowledge of the US and eastern European markets, as well as strong financial and accounting background. Taras is the project leader responsible for sales, strategy, manufacturing, procurement, and financing.

R&D Team

Lennart Larsson — is a Professor in microbial metabolomics at the Dept. of Laboratory Medicine, Division of Medical Microbiology, Lund University. Lennart has over 37 years of technical analytical chemistry experience and 11 years of microbiology experience. Lennart is the

inventor of the process and is the head of the research for cTrap. Lennart oversees the product development, purchasing and manufacturing.

Paweł Markowicz — is a PhD student working full time on the active development of the cTrap materials. Powell has a very strong background in microbiology, chemistry and latest testing methodology. Pawel is in charge of product development and testing.

Oversight

Thomas Rundqvist — is the external advisor from Lund University who has managed many start-up projects and has extensive experience in managing new ventures.

The summary of the team competencies is presented in the Table 2 below.

cTrap Team Competencies Assessment									
	Required Competencies								
Team Member	Sales	R&D	Manufacturing	Exporting	Financial Accounting	Strategic Planing	Project Management	Negotiations Procurement	Market Contacts
Rene	++			++	+	++	+	++	++
Taras	++	+	++	++	++	++	+	++	++
Lennart		+++	+			+		++	+
Pawel		++					+		
Thomas		+	++	+	++	+++	+++	++	++

Table 2

If certain technical competencies would be required, the team will source these competencies among the pool of scientists available at Lund University. External businesses competencies would be acquired on the consultancy terms. Factory personnel will be hired in the open market.

Implementation

The key assignment for the cTrap team is to prove the established claims for the performance of the cTrap material, and than based on these facts, secure firm orders for the material from target customers as the only objective presently to securing the firm orders is the inability to effectively verify the validity of our claims towards the product performance.

Presently the team has successfully formulated a coherent market need, a well defined product and target application, established the understanding of industry structures and player. The remaining implementation objectives are presented in Table 3 (page 12).

	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11
Product development							
Patent Filing (60 000 SEK)							
Cost Structure Optimization + Sourcing							
Internal and Independent Product Testing							
First firm order sourcing							
Finalized plant location							
Assembly machine and materials order							
Production Begins							

Table 3. *cTrap pre-sales roadmap*

Financial & Profitability

The financial projections for the project are positive. With all scenarios showing positive Net Present Value at 100% per annum cost of capital, and having the break even point of no longer than two years in to the future.

The project requires the maximum financing of 1.5 million SEK under all scenarios. The majority of this sum will be raised through working capital loan, and a small equity injection. In addition, the project already secured over 300 000 SEK of financing available to cover management and R&D investment activities, thereby allowing the project to continue without external financing for one year.

The remainder of financial calculations are presented in the appendix B.

In the Chart 1 you can see our product demand forecast on which we build our calculations, the motivation for these number is based on the information discussed in the prospective customers section, and assumes a linear growth rate of 5000 m^2 per month in the worst case, 10% compound growth per month for 3 years in the likely scenario until market saturation is reached, and 12.5% growth per month for 2.5 years until the product maturity, from that point on the growth will level off with an annual increase of 5-10%.

In Table B1 you can see the calculation for the assembly machine and factory output. Here the annual production of year 2012 is taken as a base, and converted to the required monthly output for the machine. The requests for quotes for the machine cost were based on this productivity figure at 75% machine load factor. The calculation assumes 54 work weeks per year and 40 hours per week of operation. If operated 24 hours a day for 5 days a week, the machine could output 3x the stated requirement. The weekends were incorporated for maintenance and potential downtime estimation.

In Table B2 you can see the calculation of the fixed production costs based on the forecast output. The cost of the machine was based on 2 quotes received from the equipment manufacturers given the technical assignment supplied by the cTrap team.

In Table B3 we present the cost break down for 1 m^2 of cTrap material. The figures presented are based on the quotes from the manufacturers of prototype materials with an estimated annual use assumed in our demand forecast. The processing cost calculation is the result of calculations in table B2.

In Table B4 you can evaluate the break down of cTrap's sales and administrative expenses.

In Table B5 we present the project's income statement. The interest expense is based on the loan amortization schedule for the machine, presented in Table B6.

In Tables B7-9 we present the forecast cash flows in best, likely and worst case scenarios, along with project Net Present Value calculations. Within the calculations we assume that the material costs will remain as shown in the Table B3 at the output level of 120 000 m^2 per month. At lower outputs the coefficient of 1.2 is added to the material costs until the level of output of 60 000 is reached, when the coefficient changes to 1.1. There is a 10% reduction in the materials cost for the increase of 60 000 units of output per month. The remainder of the data is based on the information provided in prior tables and on the information discussed earlier in this document.

Table B10 shows the forecast balance sheet in the likely scenario.

Risk Analysis

SWOT Analysis

Strengths

- A unique solution and combination of compounds to trap emissions from water damaged buildings.
- Temporarily improves the quality of life for people with respiratory diseases such as asthma in contaminated buildings.
- People can stay at home and doesn't need to evacuate the house while the wait for remediation to be performed.
- We add value to water damage remediation businesses and also Insurance companies that can implement our solution to cope with the worst problems bad indoor air quality

Weaknesses

- The product has a specific application range.
- Product is largely untested
- Venture has limited industry experience

Opportunities

- The market is a niche market with stable and strong demand
- First mover advantages

Treats

- Approval within the remediation framework may be slow or difficult
- Customers can misuse the product to let people live in places with bad air quality without doing the proper remediation work.

Based on this analysis we have conducted further detailed risk assessment, presented in the table 4 (page 14).

Table 4: *Risk analysis table*

	P	S	C	Implications	Action to prevent or mitigate
Technical Risks					
Product does not work as expected	1	3	3	Failure to deliver results will significantly hamper future operations	We have to ensure good design, manufacturing practices and quality control to avoid potential flaws.
Endorsements from technical committees of SP/IICRC are not secured	1	3	3	Failure to secure endorsements will reduce the sales potential	Product will have to be redesigned to ensure such endorsements
Market risks					
Product copies on the market and piracy	1	1	3	Given the specialised nature of the product, inferior copies are possible but not likely. Legal action will be taken to protect the reputation of the company.	Strong legal advisors and strong supplier relationships will help mitigate the likelihood of such outcome.
Extreme demand growth	2	2	4	Quality may suffer, and company reputation may become tarnished.	We have to manage to grow the production efficiency and exercise strong quality control standards.
Strong competitive pressures	2	2	4	Reduced sales margins and volumes.	Within limits exercise the patent protection rights, alter the product/ pricing mix to maintain maketshare.
Organizational Risks					
External management is needed to maintain the growth rate.	2	1	2	Failure to make appropriate changes can damage the company. Higher personnel costs.	Try to find managers with a good track record using Connect Sweden network and other networks in the innovation system.
Foreign Exchange Risk	3	2	6	Currency exchange rate can have significant impact on the bottom line	FX hedging through financial instruments and down the road adjusting supply and retail base to be in the same currency.

In this table P - represents probability, S - severity, C - coefficient, achieved by multiplying P*S. Scale is 1-3 with 3 being most sever or likely event.

Exit strategy.

Depending on the growth rate of the venture, various exit strategies will be appropriate. In the case of high growth rate where the manufacturing and distribution demands may begin to challenge the team, the preferred exit is an equity sale to an investor capable of addressing the high manufacturing and distribution volumes demanded by the market.

In the case of likely scenario, current competencies will allow the team to grow the company to maturity, and if such interest is expressed, sell off the business to an investor seeking a cash cow.

In the case of poor performance, the venture will remain a going concern, as long as its revenues cover its

operational costs. Otherwise the venture will proceed to a liquidation stage, where its assets will be auctioned off and proceeds, following the creditor payout will be redistributed amongst the shareholders.

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Appendix B

B1 Machine production rates

Monthly Output	64 583	m^2
Daily Output Equipment	2 870	m^2
Hourly Output Equipment	359	m^2
Production Rate	6	m^2/min
8 hour shift 5 days a week 54 weeks per year		
Peak output at 24 per day	193 750	m^2

B4 Sales General and Administrative Costs

Management Salaries	720 000	SEK
Managers	2	
Total Management Salaries	1 440 000	SEK
Office Rent	180 000	SEK
Communication	19 200	SEK
Travel Expenses	75 600	SEK
Other Expenses	100 000	SEK
Total SG&A	1 814 800	SEK

B2 Fixed cost of production

Covering assembly machine	1 260 000	SEK
Amortization of the machine cost 5 year straight line	252 000	SEK
Loading equipment rental	22 680	SEK
Building rental	180 000	SEK
Electricity	13 500	SEK
Telephone	4 800	SEK
Labor costs	540 000	SEK
Plant operators	2	
Total labor cost	1 080 000	SEK
Total annual production cost	1 552 980	SEK
Per m^2 production cost:	2	SEK

B3 Cost break down of 1m^2 of the material

FX USD to SEK		6.3
	USD	SEK
Technical substrate base layer	0.453	2.854
Technical substrate layer 2	0.809	5.097
Absorbent layer	1.345	8.474
Absorbent powder compounds	0.450	2.835
Technical substrate cover layer 1	0.809	5.097
Trap coating	0.176	1.109
Yarn	0.056	0.353
Total materials cost	4.098	25.817
Processing cost	0.318	2.004
Total product manufacturing cost	4.416	27.821

B5 Income statement 2012

Revenue Assumptions				
Annual Sales Volume	775000	m^2		
Sales Price	9.72	USD/m^2	61.21	SEK/m^2
Less Distribution Costs	2.91	USD/m^2	18.36	SEK/m^2
Gross Margin	6.80	USD/m^2	42.84	SEK/m^2
Less Costs	4.42	USD/m^2	27.82	SEK/m^2
Net Margin	2.38	USD/m^2	15.02	SEK/m^2
Gross Income	1 848 126	USD/Year	11 643 191	SEK/Year
Less SG&A	288 063	USD/Year	1 814 800	SEK/Year
Less Fixed Production Costs	246 505	USD/Year	1 552 980	SEK/Year
EBIT	1 313 557	USD/Year	8 275 411	SEK/Year
Less Interest Expense	12 427	USD/Year	78 287	SEK/Year
EBT	1 301 131	USD/Year	8 197 124	SEK/Year
Less Taxes	345 466	USD/Year	2 176 433	SEK/Year
Net Income	955 665	USD/Year	6 020 691	SEK/Year

C1 Cumulative cash-flow - break even analysis

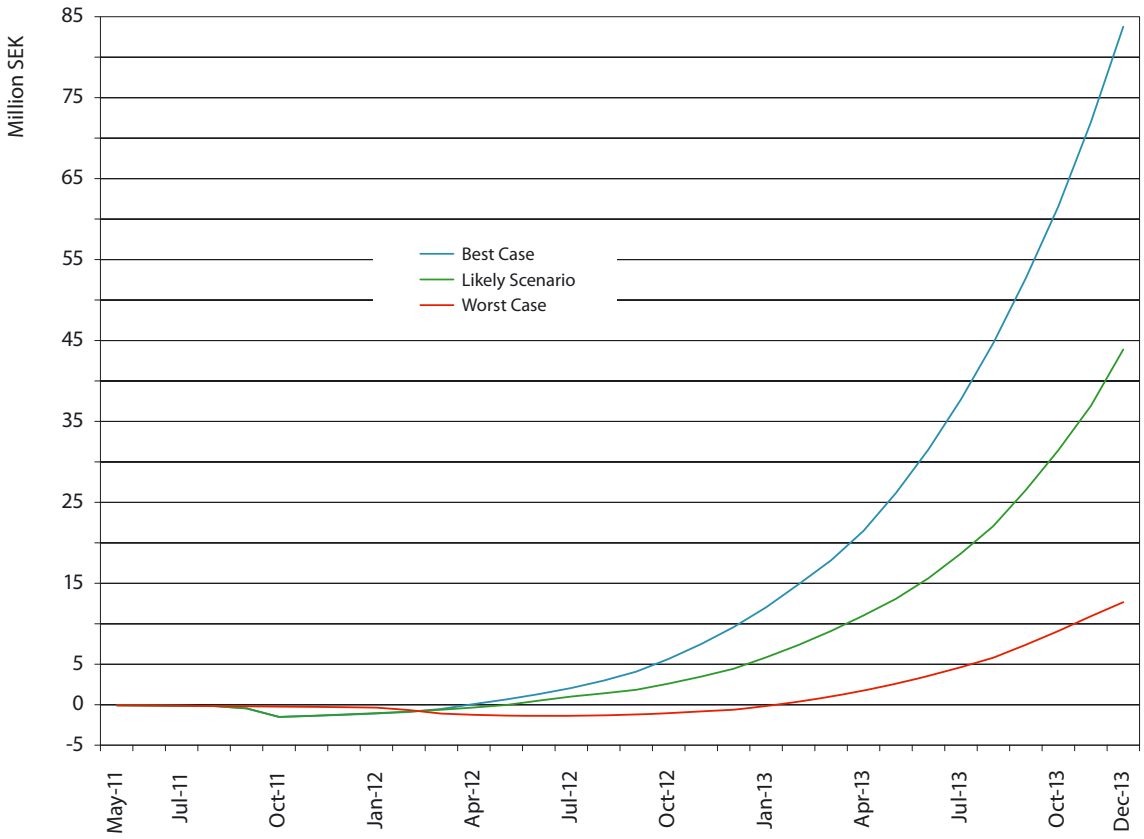


Chart B1. *cTrap cumulative cash flow.*

B6 Covering assembly/packaging machine loan amortization schedule SEK

Current Value	1 260 000
Down Payment (20%)	252 000
Loan Balance	1 008 000
Interest rate	9.00%
Loan term (months)	36
Monthly Loan Payment	32 054

	Oct-11	**Nov-11**	**Dec-11**	**Jan-12**	**Feb-12**	**Mar-12**	**Apr-12**	**May-12**	**Jun-12**	**Jul-12**	**Aug-12**	**Sep-12**
Principal Reduction	24494	24678	24863	25049	25237	25427	25617	25809	26003	26198	26394	26592
Interest	7560	7376	7191	7005	6817	6628	6437	6245	6051	5856	5660	5462
Remaining Balance	983506	958828	933965	908916	883678	858252	832635	806825	780822	754624	728230	701638

	Oct-12	**Nov-12**	**Dec-12**	**Jan-13**	**Feb-13**	**Mar-13**	**Apr-13**	**May-13**	**Jun-13**	**Jul-13**	**Aug-13**	**Sep-13**
Principal Reduction	26792	26993	27195	27399	27605	27812	28020	28230	28442	28656	28870	29087
Interest	5262	5061	4859	4655	4449	4242	4034	3824	3612	3399	3184	2967
Remaining Balance	674846	647853	620658	593258	565654	537842	509822	481591	453149	424494	395623	366536

	Oct-13	**Nov-13**	**Dec-13**	**Jan-14**	**Feb-14**	**Mar-14**	**Apr-14**	**May-14**	**Jun-14**	**Jul-14**	**Aug-14**	**Sep-14**
Principal Reduction	29305	29525	29746	29969	30194	30421	30649	30879	31110	31344	31579	31816
Interest	2749	2529	2308	2085	1860	1633	1405	1175	944	711	475	239
Remaining Balance	337231	307706	277960	247990	217796	187376	156727	125848	94738	63394	31816	0

B7 cTrap Cash Flow Best Case 000 SEK

2011	May	June	July	August	September	October	November	December	YTD
Inflows									
Sales Revenue							1285	1440	2725
Outflows									
PCT application costs	70								70
Management salary		25	25	25	25	25	25	25	175
Other administrative expenses		1	1	1	1	1	1	1	7
Testing related expenses		7	7	7	7	7	7	7	49
Covering assembly machine pre-payment					252				252
Manufacturing fixed costs						17	17	17	50
Production salary						45	45	45	90
Raw material costs						929	1041	1166	3136
Interest Cost						32	32	32	96
Net Cash	-70	-33	-33	-33	-285	-1056	118	147	-1245

2012	January	February	March	April	May	June	July	August	September	October	November	December	YTD
Inflows													
Sales Revenue	1612	1806	2023	2265	2537	2841	3182	3564	3992	4471	5008	5609	38911
Outflows													
Management salary	25	25	25	25	25	25	60	60	60	60	60	60	510
Other administrative expenses	31	31	31	31	31	31	31	31	31	31	31	31	375
Manufacturing fixed costs	18	18	18	18	18	18	18	18	18	18	18	18	221
Production salary	45	45	45	45	45	90	90	90	90	90	90	135	900
Raw material costs	1306	1462	1501	1509	1811	1992	2192	2411	2652	2674	2941	3235	25687
Interest Cost	32	32	32	32	32	32	32	32	32	32	32	32	385
Net Cash	155	192	369	604	574	652	759	922	1109	1566	1835	2097	10833

2013	January	February	March	April	May	June	July	August	September	October	November	December	YTD
Inflows													
Sales Revenue	6282	7035	7880	8825	9884	11070	12399	13887	15553	17419	19510	21851	151595
Outflows													
Management salary	60	60	120	120	120	120	120	180	180	180	180	180	1620
Other administrative expenses	31	31	62	62	62	62	62	62	62	62	62	62	687
Manufacturing fixed costs	18	18	20	20	20	20	20	20	20	55	55	55	345
Covering assembly machine №2 pre-payment			252							252			504
Production salary	135	135	135	180	180	225	225	270	270	315	360	405	2835
Raw material costs	3559	3915	4306	4737	4737	5211	5732	6305	6935	7629	8392	9231	70688
Interest Cost	32	32	32	64	64	64	64	64	64	64	96	96	737
Net Cash	2446	2844	2952	3641	4700	5368	6175	6985	8021	8862	10364	11821	74179

B8 cTrap Cash Flow Likely Scenario 000 SEK

2011					May	June	July	August	September	October	November	December	YTD
Inflows													
Sales Revenue											1285	1414	2699
Outflows													
PCT application costs					70								70
Management salary						25	25	25	25	25	25	25	175
Other administrative expenses						1	1	1	1	1	1	1	7
Testing related expenses						7	7	7	7	7	7	7	49
Covering assembly machine pre-payment									252				252
Manufacturing fixed costs										18	18	18	55
Production salary										45	45	45	135
Raw material costs										929	1022	1125	3076
Interest and loan payments										32	32	32	96
Net Cash					-70	-33	-33	-33	-285	-1058	135	161	-1217

2012	January	February	March	April	May	June	July	August	September	October	November	December	YTD
Inflows													
Sales Revenue	1555	1711	1882	2070	2277	2505	2755	3031	3334	3667	4034	4437	33258
Outflows													
Management salary	25	25	25	25	25	25	60	60	60	60	60	60	510
Other administrative expenses	31	31	31	31	31	31	31	31	31	31	31	31	375
Manufacturing fixed costs	18	18	18	18	18	18	18	18	18	18	18	18	221
Production salary	45	45	45	45	45	45	90	90	90	90	90	90	810
Raw material costs	1237	1361	1497	1647	1811	1826	2009	2411	2652	2674	2941	3235	25301
Interest and loan payments	32	32	32	32	32	32	32	32	32	32	32	32	385
Net Cash	166	198	233	272	314	527	515	388	450	762	861	970	5657

2013	January	February	March	April	May	June	July	August	September	October	November	December	YTD
Inflows													
Sales Revenue	4881	5369	5906	6497	7146	7861	8647	9512	10463	11509	12660	13926	104378
Outflows													
Management salary	60	60	60	60	120	120	120	120	120	120	120	120	1200
Other administrative expenses	31	31	31	31	31	62	62	62	62	62	62	62	593
Manufacturing fixed costs	18	18	18	18	18	20	20	20	20	20	20	20	234
Covering assembly machine №2 pre-payment						252							252
Production salary	90	135	135	135	135	135	180	180	180	225	225	225	1980
Raw material costs	3235	3559	3915	4306	4737	4690	5158	5674	5548	6103	6713	6462	60101
Interest Cost	32	32	32	32	32	32	64	64	64	64	64	64	577
Net Cash	1414	1534	1715	1914	2073	2550	3042	3391	4468	4914	5455	6973	39441

B9 cTrap Cash Flow Worst Case 000 SEK

	2011				May	June	July	August	September	October	November	December	YTD
Inflows													
Sales Revenue					0	0	0	0	0	0	0	0	0
Outflows													
PCT application costs					70								70
Management salary						25	25	25	25	25	25	25	175
Other administrative expenses						1	1	1	1	1	1	1	7
Testing related expenses						7	7	7	7	7	7	7	49
Net Cash					-70	-33	-33	-33	-33	-33	-33	-33	-301

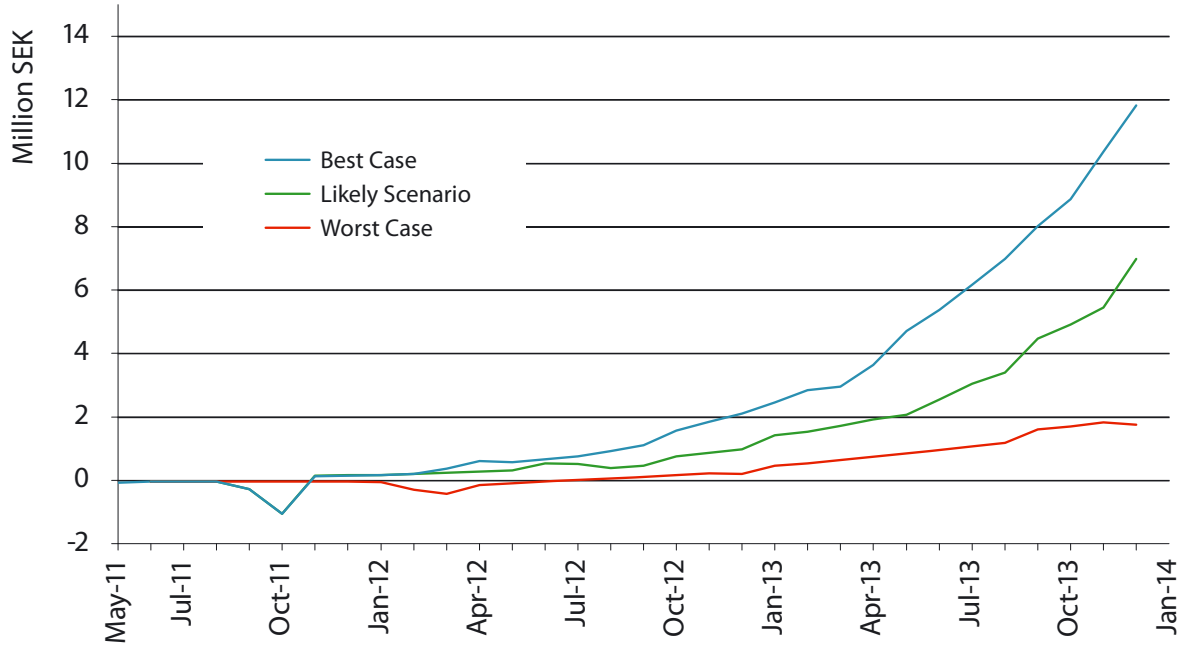
	2012	January	February	March	April	May	June	July	August	September	October	November	December	YTD
Inflows														
Sales Revenue		0	0	0	428	643	857	1071	1285	1500	1714	1928	2142	11568
Outflows														
Management salary		25	25	25	25	25	25	25	60	60	60	60	60	475
Other administrative expenses		31	31	31	31	31	31	31	31	31	31	31	31	375
Covering assembly machine pre-payment			252											252
Manufacturing fixed costs				18	18	18	18	18	18	18	18	18	18	184
Production salary				45	45	45	45	45	45	45	45	45	45	450
Raw material costs				310	465	620	775	929	1084	1239	1394	1549	1781	10146
Interest and loan payments					32	32	32	32	32	32	32	32	132	388
Net Cash		-56	-308	-429	-156	-97	-37	22	46	106	165	224	206	-314

	2013	January	February	March	April	May	June	July	August	September	October	November	December	YTD
Inflows														
Sales Revenue		2464	2785	3106	3428	3749	4070	4392	4713	5034	5356	5677	5998	50771
Outflows														
Management salary		60	60	60	60	60	60	60	60	60	60	60	60	720
Other administrative expenses		31	31	31	31	31	31	31	31	31	31	31	31	375
Manufacturing fixed costs		18	18	18	18	18	18	18	18	18	18	18	18	221
Production salary		45	90	90	90	90	90	90	90	90	135	135	135	1170
Raw material costs		1846	2059	2272	2485	2698	2911	3124	3337	3227	3421	3614	3976	34970
Interest Cost		32	32	32	32	32	32	32	32	32	32	32	32	385
Net Cash		463	526	635	743	851	960	1068	1176	1607	1690	1818	1746	13283

B10 Balance sheet likely scenario k SEK

Assets	Dec-11	Dec-12	Dec-13
Cash and Working Capital	90	748	5 580
Charter Capital	50	50	50
Inventory (Raw materials and completed products)	141	444	2 089
Assembly Machine 1 (5 year equipment)	966	714	462
Assembly Machine 2 (5 year equipment)			882
Patent (at book value, 20 year straight line)	140	133	126
Receivables	71	222	1 393
Liabilities			
Vendor Payments	112	324	1 292
Assembly Machine Loan	934	621	1 136
Equity			
Charter Capital	50	50	50
Owners Equity	362	1 317	8 103

C2 Actual cash-flow



cTrap

Improving indoor air quality
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Section B - Theoretical Reflection

Theoretical Reflections

Entrepreneurial motivation as the essential factor for venture success

Taras Seryy
BUSP 01
Masters Program in Entrepreneurship
May 30, 2011

Index

Abstract

In this paper I review the current body of knowledge linking entrepreneurial motivation and performance. From this frame of reference I evaluate my experiences in commercialization of university research within the context of the entrepreneurship program.

Commercialization of university research and external ideas has been a major priority of program. The students are strongly encouraged to develop externally triggered opportunities, as it is the general belief that having additional resources attached to these opportunities should improve the chances for success. Nothing could be further from the truth.

Without proper motivation, entrepreneurs are at a significant disadvantage when facing the challenges on the way towards commercialization, and without proper support, are forced to abandon the projects that are commercially viable.

The work examines circumstances leading up to such outcomes and provides recommendations for improving the results of future commercialization projects.

Introduction

Entrepreneurship is a change mechanism in the economy, that is driven by persons (entrepreneurs) seeking to gain greater economic rewards by the means of informatively altering the conditions of economic equilibrium. They do so by filling in existing market niches or creating new markets altogether. (Seryy, 2010)

Within this context entrepreneurs are the agents of change, the individuals willing to take on the risk of uncertainty for their future livelihood in exchange for a greater, and possibly unattainable, goal of creating a new or altering an existing enterprise; that would in turn yield substantial economic benefit and/or alter the way society operates. (Seryy, 2010)

Based on the above definitions, it becomes apparent that in order for the entrepreneur to take on the risks of uncertainty, it is essential to believe in attainability of certain tangible or intangible benefits. Without the perceived attainability of these beliefs, it's exceptionally difficult to use internal energy of the entrepreneur to drive the project forward. Without proper conditions to foster this belief, the project will be predisposed to failure.

Problem

The key issue within the currently existing educational program is the establishment of highly ambitious goals for the student entrepreneurs, with expectations of entrepreneurial behavior and requirements to take on various risks, while providing minimal incentives aside from imposing obligations upon them. Due to such motivational structure the likelihood of the new venture start-ups (further referred to as the entrepreneurial projects) succeeding is significantly diminished.

In this paper I want to focus on the motivation as one of the key influencing factors for success or failure of the projects that are externally triggered or assigned, within the entrepreneurial educational programs. I will try to defend the position that externally triggered entrepreneurial projects are at a significant disadvantage in terms of success, without appropriate motivational incentives to induce performance of the entrepreneurs compared to the projects that have been independently selected by the entrepreneurs.

Frame of Reference

The present research and theory development has been concentrated on identifying the details of the entrepreneurial process and opportunity identification. Within this context various theories such as the Resource Based View (Barney, 1991), the effectuation process of entrepreneurial opportunity identification (Sarasvathy, 2001) and numerous theories emerged. These works greatly enhance the understanding of the entrepreneurship phenomenon, but mostly deal with everything but the entrepreneur as an individual (Shane, 2003; Landström, 2010).

Within the scholarly field there have been numerous attempts to establish the relationship of entrepreneurship success and motivation. Yet, the validity of many studies has been disputed (Aldrich & Zimmer, 1986; Carroll & Mosakowski, 1987). As a result, the bulk of studies concentrated on the entrepreneurial process itself, omitting the individual's role. Shane, Lock and Collins (2003) wrote: “Although this (author’s note: focus on the entrepreneurial process) focus has greatly enhanced our understanding of the entrepreneurial phenomenon, it ignores the role of human agency. Entrepreneurship depends on the decisions that people make about how to undertake that process.” They further continue that “inadequate empirical work does not negate the importance of understanding the role of human motivation in the entrepreneurial process. In fact, even sociologists who have argued strongly against the usefulness of trait-based research in entrepreneurship implicitly acknowledge that motivation must matter to this process.” They also believe “that these criticisms have resulted in insufficient consideration of the role of the human motivation in the entrepreneurial process in recent entrepreneurship research. Consequently, we are left with theories of entrepreneurship that not consider variation in the motivations of different people.” This omission is believed to be “problematic because, as Baumol (1968, p. 66) eloquently argued, the study of entrepreneurship that does not explicitly consider entrepreneurs is like the analysis of Shakespeare in which ‘‘the Prince of Denmark has been expunged from the discussion of Hamlet.’’ (Shane, 2003)

In another study Johnson (1990, p. 48) in his article stated that “it remains worthwhile to carefully study the role of the individual, including his or her psychological profile. Individuals are, after all, the energizers of the entrepreneurial process.”

So what are the motivational factors critical to motivate the entrepreneur?

“Many investigators have observed that the entrepreneurial role necessitates independence. First, the entrepreneur takes responsibility for pursuing an opportunity did not exist before. Second, entrepreneurs are, in the end, responsible for results, whether achieved or not achieved. Further, individuals may pursue entrepreneurial careers because they desire independence.” (Shane, 2003)

Other studies investigated the need for autonomy and control over outcomes, as McClelland (1961) showed that individuals with high desire for achievement prefer situations in which they believe to be in control over developments. “This point was extended by Rotter (1966) who argued that individuals with an internal locus of control would be likely to seek entrepreneurial roles because they desire positions in which their actions have a direct impact on results.” (Shane, 2003)

Another critical motivation factor for the entrepreneur is passion. “The true or rational egoist passionately loves the work; they love the process of building an organization and making it profitable. They are motivated to do what is actually in their own interest - that is, to do everything necessary.” (Shane, 2003) This passion significantly influenced the firm growth as was shown by Baum, Lock and Smith (2001) in a study titled *A Multidimensional Model Of Venture Growth*.

Although the concept of achievement motivation introduced by McClelland has been traditionally considered critical to entrepreneurial motivation, studies have shown that achievement motivation is not an influencing factor in student entrepreneurship. (Sexton and Bowman, 1983)

Further the individual has to perceive that the opportunity cost of engaging in the activity is justified by the rewards. In an article titled *Opportunity Costs and Entrepreneurial Activity* Amit, Meuller and Cockburn show that there is direct relationship between the opportunity cost of engaging in the entrepreneurial activities and their willingness to pursue such activities.

The value of financial motivation for starting a new venture especially in the Nordic countries

has also been discounted as shown in the study by Wiklund, Davidsson and Dalmar, 2003. Yet for many individuals from other cultures, the financial incentives are directly related to pursuing entrepreneurial activities. (Amit et. al, 1995)

So, if we consider personal motivation critical to entrepreneurship, we need to examine the relationship of motivation and firm's success. Baum et. al, (2001) showed that "organizations led by highly motivated entrepreneurs may begin to reflect the character of these entrepreneurs, which further enhances performance."

In addition to the personal motivation factors, there have been numerous studies trying to link motivation to external factors such as push and pull entrepreneurship. This framework was initially developed in the mid 1980s and has undergone numerous studies and revisions. Amit and Muller (1995) have shown that the ventures started by entrepreneurs driven by pull factors have been much more successful than peers pushed in to the entrepreneurial endeavors. This means that entrepreneur should undertake the projects out of interest rather than other situational factors.

These numerous studies and analysis articles suggest that, although not a sufficient condition for success, the individual motivations of the entrepreneur in terms of personal self efficacy, need for achievement, maintaining the locus of control, and a desire to fulfill personal goals are necessary conditions for success.

Method

To generate the data to support the previously described theoretical assumptions, I will draw upon the methods of autoethnography (Anderson, 2006) reflecting upon my experiences during the participation in the entrepreneurship program in the university setting, as well as conversations with peers. Some of these experiences have been documented in weekly journals; some are recollections and conversations with other students that occurred throughout the program. Although an objection can be raised to the recollections and conversations part of this ethnographic study, I am willing to argue that the validity of stated journals data is no more relevant to the discussion on the basis of the following:

Some individuals are much more introverted than others, and when asked to disclose certain aspects of their experience at the moment of occurrence, simply state the publicly known issues, while retaining their true emotions and opinions to themselves. At a later date, when the emotional commitment is absent, they may much more openly discuss issues at hand than they would at the time of the occurrence.

At the onset of the assignment to keep the journals as part of the learning experience, many of the participants of the study approached the task as routine, providing enough data to fulfill the assignment requirements, while keeping the critical observations off the record.

Project Description

Situational background

After the landmark study by David Birch (1979) that demonstrated that most jobs are created by small and start-up enterprises, governments worldwide have made it their policy to foster entrepreneurship. One of the ways to foster new venture developments is to educate people about the process, hence numerous entrepreneurship programs have been set up worldwide.

In addition to promoting entrepreneurship, universities generate large quantity of new technologies, so combining entrepreneurial education and technology commercialization seems logical. In the program a great deal of emphasis has been placed on technology commercialization. Groups of students were assigned to a research project that was seeking commercial evaluation. Student entrepreneurs had the ambitious task of shaping the innovations to become commercially viable, and to find funds to launch the products shortly after the end of the program. In addition to these tasks, the groups were also highly encouraged to participate in various business competitions such as Venture Cup and Dragon's at the University.

Student demographic

The individuals finally chosen to participate in commercialization of projects were primarily

foreign students on an educational residence permit. Some were older with work experience, others were recent bachelor graduates.

Existent incentives

In Sweden, unlike other countries, the intellectual property developed during university research remains with the researcher, and not with the university. Therefore, the researcher owns the bulk of the future business. The university has established a research commercialization initiative, where experienced business managers assist researchers in taking steps to commercialize their innovations. By entering their research in to this system, they give up 15 % of their intellectual property ownership, in exchange for commercialization assistance. Under this scheme, the university innovation network acts as an advisor, while the final decisions about the business rest exclusively with the researchers.

For the participation in commercialization projects the students are offered a possibility to continue with the project upon the completion of their studies and receive a salary, if their efforts are successful, and they manage to secure first customers by the end of their program. Yet it should be noted that the projects are conducted with teams of 2-5 students while only one student may continue on the paid basis after the program completion.

Students are also promised to receive one half of the winnings during the phases of the business competitions in which they will participate during the program. Prize purses range from 2500-100000 SEK.

Motivation of individual parties for participation in the project

The researcher who introduced the innovation for commercialization, was looking to establish the occupation for himself upon retirement, and had very limited aspirations towards a business that would grow above a lifestyle firm, as was communicated by the researcher, and by his colleagues.

University's innovation system purpose is to promote projects to become larger self sustaining enterprises. The key investment criterion for the innovation system is to fund

perceived gazelles or firms with large growth potential.

The motivation of students for participation in this project is compliance with academic requirements of the program, as great emphasis has been placed by the program leadership for student participation in commercialization projects.

Opportunity costs

Researchers involved in commercialization, have very low opportunity costs. Most of their research work is being funded by the university, and the main opportunity cost is in the time allocated to various meetings, and partial loss of control over the intellectual property when entering the innovation system.

University innovation system opportunity cost is in the business manager's time spent on various meetings and coordination work, both with the students and researchers.

Students face the greatest opportunity cost of the involved parties. Most of the students entering the program have aspirations of starting their own business or working on the project that they care about, and within this context they are aiming to have a stable set of activities upon graduation. They also have the greatest opportunity cost of failure, as the failure of the project will be damaging both financially and motivationally.

The majority of the students, especially international students, although have been spared tuition fees, have substantial sums that they need to pay each month for rent and food, therefore investing a great deal of time in the project, the students forego the possibility to earn money in part-time jobs or freelance activities needed to support themselves.

Engaging in an entrepreneurial project, where you are being placed in a limited control and high responsibility position of a manager poses great challenges. In addition to taking on risks of the entrepreneurial process, the students have to tackle on the agency (Parhankangas, 2007) and political risks of management.

Limitations

This work is limited by my perception and viewpoint of events that occurred during this program, and although post rationalization argument is often brought up to critique these types of investigations, it should be noted that the rational evaluation of past actions helps us create knowledge.

Cultural aspects also shape my interpretation of events, so within this context the investigation could be framed within the Eastern European and American examination of the events in Sweden.

Analysis

Process

At the end of the first month into the program the students were gathered for a meeting, where the researchers have presented their innovations and the groups of 6 students were assigned to perform initial investigations of their commercial viability. I recall that the first thoughts about the presented innovations was that they were either highly niche applications, too early in the development process, or too technical for the students to handle. Much of my impressions were supported by the discussions with other program participants who had prior work experience in commercialization. By realizing the lack of feasibility to successfully undertake entrepreneurial ventures, the likelihood of success is greatly diminished. (Fitzsimmons, 2010)

Following the presentation, the student groups attempted to gather initial market strategy for the innovations, which they presented to the researchers and business managers from the university's innovation system. Based on this presentation, the researchers were to pick a team of three students who chose to participate in the project after the initial development. In the case of our project three out of six students immediately excluded themselves from further participation, citing lack of interest, lack of experience and unfamiliarity with the subject matter. Three other students were willing to entertain the idea for further development, yet nobody was truly excited about the subject matter. The stated incentives for

project participation were of little motivational value as well. At the end, my partner and I chose to continue with this project, on the following basis: It is the general understanding that the project has limited future; it is not immediately feasible given our set of prior experiences, knowledge, and networks. Despite the perceived difficulties, we will attempt to use our skills to further investigate the commercial possibility of the project. It is also our understanding that by choosing to participate in this project we will receive assistance in project development from the university and that all other projects that we wish to undertake ourselves will be purely on our own merit.

The following month, we have sincerely put in our best effort to find commercial application for the technology. Our results were fruitless. All the entrepreneurial theories suggested by the course were completely irrelevant to our project, since it was within a highly regulated, conservative and unfamiliar industry. To further complicate the process, the technology was in infancy, and required substantial time investment to shape it into a viable product.

At the beginning of the third month, we were required to participate in a business plan competition with our business ideas; one of these ideas was the commercialization effort. I have submitted three business proposals to the competition. One of the independent ideas advanced to a top twenty nomination, and our commercialization idea entered top ten. The main reason for the success of the commercialization idea was the jury's misunderstanding of the technology benefits. This was substantiated by the feedback provided by the jury.

Following the winning of the first phase of the business plan competition, my partner and I were formally committed to continuing the project, despite my reservations for the commercial viability of the venture.

The following month and a half, we have continued occasional attempts to find clients for the technology, as it was rather apparent that without a completed prototype, it was virtually impossible to provide tangible results as was stated by numerous parties who were, in principle, interested in our product.

Another issue worth noting is that the patent application review for this technology was not available until the end of the fourth month into the project, and our first months of work were under substantially different claims that were actually attainable.

Towards the end of the fourth month, the group took a road trip, along with the researcher to the SP technical research institute of Sweden, for an independent evaluation of the technology. The results were discouraging:

> The biggest concern was the inability to use the product as was initially intended, as the convective currents were highly unpredictable, and covering one area of the wood frame house did not guarantee the absence of emissions from multiple other areas. Therefore the board agreed that management needs to undertake steps to acquaint themselves with water damage remediation procedures and to study the industry infrastructure, and to better understand the value chain and industry players. (Seryy, 2011, Journal for Jan. 21st)

This setback was not surprising as the researcher was the specialist in microbiology, and not in building science. After this trip, I have lost all faith in the project, my partner did the same and has concentrated on his own agenda, agreeing to provide occasional assistance with the task, as it was the official project for the degree. I chose to continue limited participation, as I believed the project deserved the final chance and to maintain positive relationship with the program management.

At this point, I would like to take a side step, and put our project in context with other projects in the program. Of the eight projects introduced in to the program, five made it past the fifth month. One project was dropped by the researchers, after the initial student evaluation. Two were abandoned by students as the ideas had minuscule market growth potentials. Of the remaining five projects, one was in the ready to sell state, and the rest were in the developmental infancy, with at least three to four months worth of product development time. One team commercializing the research, were quite certain of their abilities, as the project was within the industry where they worked prior to entering the program. This team was forced to abandon the projects as the researchers chose not to share an equity stake with the entrepreneurs.

Upon returning from the Christmas break, our project had a board meeting where I voiced concerns over the current way of applying the technology. The researcher did not share my viewpoint, and we agreed to study the matter further. Within the next two months, I

undertook the initiative to acquaint myself with the industry and understand the current rules and procedures. During this initiative, I have build up a good relationship with the readership of a trade organization specializing in the area where the invention was to be applied.

> “Surprisingly during one of the calls I started talking to the gentleman who was quite surprised that I called him, but later turned out to be highly informative and very helpful. As I discovered later, he was the VP of a very influential trade organization.” (Seryy, 2011, Journal for Jan. 28th)

> “Had more conversations with my contact as to what areas of the restoration process can we fit our product. I learned much about the remediation, especially after picking up the keywords from him.” (Seryy, 2011, Journal for Feb. 4th)

As the development continued further, it was obvious that the product, in the form allowed by the patent, was a niche application with limited market potential.

These findings were presented to the researcher, who by this time has indeed realized that the original vision for the product will not materialize.

> “This week was crucial to re-evaluating the strategy for our product as the results of the board meeting showed that the direction forward is either a research project or a business project. A research project will continue without me and my partner. A business needs a realistic and feasible business model. The only realistic business model that I see, is working out a method how to handle level 3 water damage in the US.”(Seryy, 2011, Journal for Mar. 4th)

At this point in the program, the line of development for the project was obvious:

1. Continue product development as an academic exercise.
2. Collect data based on the understanding of the industry developed during the process.
3. If the results are successful, attempt to commercialize the innovation with the developed datasets.

Given the lack of feasibility to establish a business in four moths, we wanted to switch to a different venture that was perceived more feasible and enjoyable. Unfortunately, such was not

possible as the program expected participation in the business plan competition and various other activities. Therefore, instead of concentrating on activities that would result in creating a viable business, at least in theory, given the time and situational constraints, I had to continue the development of this project as to fulfill the program requirements and other obligations.

The vision of the researcher towards future cooperation and towards the goals for the company did not add towards motivation either. As the project became more defined, the business manager from the university innovation system brought up the question of the roles that each of the student entrepreneurs would play in the company. My candidacy was introduced for the role of the project leader and potential CEO. Immediately during this meeting, the researcher voiced his concerns about our ability to fulfill his vision for the company, which was a small lifestyle company, selling direct to consumers in Sweden, and going totally against the conceptual strategy that was developed. We envisioned a small scale exporter with primary markets in the USA and continental Europe. This statement was a complete surprise, since during all prior meetings the researcher was in complete agreement with our strategy.

Despite the obstacles and pessimistic attitudes, the business plan I wrote for the project received a top 10 nomination in the final of Venture Cup South competition, but in the end was not chosen for continuation. In the same competition the project that was driven by the fellow student fielding the effort on his own project, who at the beginning chose to undertake the risk of loosing support from the program, has managed to overtake all other university supported projects. I would attribute the difference in performance simply due to outward excitement projected by the winning team during the personal presentation to the jury.

After this competition, the student groups also had to fulfill numerous other activities within the program using this project.

In the end, the researcher, university innovation system and the team agreed that the project may indeed become viable within the tightly defined market niche, yet it was too early to launch the company, given limited financial resources and researcher's desire to remain the sole owner of the company.

Discussion

During this project, me and my partner, despite our best intentions, were inherently demotivated from using our entrepreneurial skills and acquired entrepreneurial knowledge in launching the project for the following reasons:

● Lack of independence

Within the program, we could only develop the commercialization strategy that was not market driven, but was researcher's vision oriented. Instead of finding creative ways to utilize resources at hand and fitting the market requirements using effectuation techniques, we had to conform towards the vision of the product as seen by the researcher and limited to causal entrepreneurial processes. (Sarasvathy, 2001) Because the final decisions rested with him, it took considerable time and effort to convince him in our abilities to commercialize products and to follow our strategy of development. By the time he was truly on board with our vision, the program was nearing the end, and it was too late for us to implement it further, on the level that was acceptable to the university innovation system to receive further funding.

● Lack of control

Typically within a project, the entrepreneur has a particular vision, that he or she presents to others, and uses the motivational factors to convince others in sharing this vision. For many people the task is daunting as is, but it is even more complex to convince others to share in the vision, of another person, which you do not share, or even understand. In addition, the entrepreneur has direct control over the resources that he or she acquires for the project. In our case we had very limited control over the development of technology and virtually no control over the financing strategies for the venture development. Being simply business development managers, we were obliged to follow the financing plans prescribed by the innovation system and the researcher.

● Lack of drive

When you know that your work is not appreciated, and most of your efforts will go uncompensated, it’s exceptionally difficult to put in your best effort. Even though you attempt to make your best effort, the lack of excitement about a particular project shows on the subconscious level. Some individuals are more skilled than others at masking their true

emotions, but in my case, when I am excited about something, it really shows.

So, given that the motivation was not present, and our performance was sub-par, we can raise the following question: given the set of available constraints, could have the projects succeed with proper motivation? To answer this question, I would first need to establish the definition of success. If we define success as the creation of a business entity that would generate a profit, than the answer is a definite yes. If we define success as creation of the business entity at the end of entrepreneurship program, the answer is less apparent, since there was still a large amount of work that needed to be completed prior to commercialization. If I felt that this was my project, I could have leveraged my connections, placed more effort in convincing other stakeholders and motivated the research team to reduce development time by several months, which may have been enough to launch at the end of the program.

Burg et al. in a study titled *Creating University Based Spin-Offs: The science based perspective* dully noted that “creating a balance between incentives for research and teaching and those for entrepreneurship is therefore a delicate matter. Regarding the latter balance, the universities should not engage in university spin-offs because of the expected financial benefits; there are hardly any, as the evidence collected by Shane (2004) suggests. If a university commits to entrepreneurship and incubation of new firms, they should do so to commercialize ideas and technologies developed in this university into applications with huge potential benefits to society. The side effect, intended or not, is that the reputation and prestige of the incumbent university will very likely benefit.”(Burg 2008)

So if the university should have humanitarian and not commercial interests at hand, why was the feeling of being used as free labor cited as the number one issues by other students in the class involved in or contemplating their involvement in the university commercialization? One of the main reasons, as I have discovered later, was a simple misunderstanding of the financial and motivational states of the entrepreneurial students by the researchers.

Majority of researchers involved in the university commercialization projects have prior management experience dealing with graduate students, who in the Swedish educational system receive financial compensation for their work. Additionally, most of the Swedish students have a government stipend that allows them to cover rent and essential expenses. Majority of the students in the entrepreneurship program are using their own funds to support

themselves. Therefore the opportunity cost of idle work is very high. At the same time, my researcher was sincerely convinced that my participation was funded by the state. When he has learned, indirectly, that I was in complex financial situation, his behavior changed substantially, but it was very late in the project to affect the outcomes.

Conclusions

From the presented information it is clear that proper motivation – providing the entrepreneur with independence and autonomy over the financial and strategic plans, goes a long way in advancing the development of the projects that eventually may lead to their success. When the entrepreneur is properly motivated, he or she starts to emit the drive energy, that energizes others and helps attain successful outcomes, compared to the projects where the participation of the players is done purely on the basis of compliance, and the key decisions are implemented by the individuals whose expertise remains outside the business development field.

Although the phenomenon of entrepreneurship, and in particular successful entrepreneurship, requires multidimensional understanding, many aspects of the puzzle have to fit, the drive and energy of the entrepreneur provide the cohesive force required to assemble them together.

Entrepreneurial success is hard to attain – placing entrepreneurs in demotivating environment makes their success downright impossible.

Suggested Further Developments

Based on this study and experiences within the program, I suggest altering the commercialization project and support system within the program.

First, the commercialization projects introduced into the program should be thoroughly screened and evaluated on the technology level of development and projects with small time to market should be entered in to the system. If the technologies are in the idea stages, or pre-prototype stage, only the students with substantial prior experience in the field of the invention should be assigned to these projects.

Second, the researchers should be briefed on the financial and motivational issues of the student entrepreneurs, and should be willing to surrender a substantial amount of control over the commercialization outcomes. When the student entrepreneurs are introduced into the project, it is no longer the child of the researcher, but a collaboration effort of the group.

Third, the researchers and students need to undergo team and trust building exercises, as to create a cohesive team at the outset. One of the largest obstacles faced by the student teams this year was inability to gain trust and support from the researchers. This type of activity goes a long way towards improving non-financial motivation of the entrepreneurs

Fourth, provide students with firm financial incentives to participate in the commercialization projects. Student entrepreneurs should not be considered free labor since to successfully launch a product in a short time, especially when the intended path for commercialization is not feasible they often fall back on the previously developed network or skills. Only within a very narrow field can the university supply a useful incubator network.

When providing financial incentives, attach them to clear, reasonable and flexible performance goals. Student entrepreneurs should be assured that if they do indeed put in their best effort towards the commercialization, this effort will be rewarded, as the odds of success within a short period of time are extremely low. The financial intensives may not be monetary, but could include an equity position in the project, even if the project was not launched at the end of the program.

Fifth, provide all students, irrespective of what project they choose, the same availability of resources and support. Encourage them to foster their projects if they sincerely believe in their success. Let them fail on their own, do not discourage them, at least they will enjoy the experience, suffer lesser psychological consequences of failure.

Finally, the program needs to educate the students about the available resources at their disposal at the outset. Within the current program, the complete understanding of the available possibilities arrives only in the final months of the program, when it’s too late to utilize them to the fullest extent for the current projects.

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