PRE-INCUBATION NODE FOR TALENT INCLUSION & PRODUCT INNOVATION - A BOOTSTRAPPING TECHNIQUE FOR SOCIAL ENTERPRISES

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ABSTRACT

How does a social enterprise with limited capital grow a team of talented individuals in order to develop its product line? Although this challenge is special to SEED, the social enterprise highlighted in this case, it could very well be a question for every other social venture that needs to grow its team with the limited resources. SEED is a US-based startup that develops mechanized products for farmers in India and Bangladesh. To grow its product portfolio, SEED needed local engineering talent that was committed to its mission of social cause and was willing to work for less than corporate salaries. SEED was also looking for a development lab space without having to pay the high realty rates in the city of Mumbai. This unique need brought about a collaborative model between SEED, National Entrepreneurship Network (NEN)-a non-profit that promotes entrepreneurship and Sardar Patel Institute of Technology (SPIT), Engineering College and an NEN-member institute.

This pre-incubator model develops young engineering and business minds to think like an entrepreneur and apply creative solutions in an innovative manner to solve rural and social issues. Through this model,

1. SEED has a team developing a new product that could potentially join the company at the end of the project period.
2. SPIT is provides its students with projects that have potential customers and can be commercialized.
3. NEN facilitates real world entrepreneurial experience and training to the students in innovation and commercialization.

This model is thus a potential new route for social enterprises to grow talent and team while developing new innovative products or markets and business plans despite their limited resources. It also illustrates how talented individuals could be nurtured to become entrepreneurs and develop solutions for social needs. The students graduate with a more practical and wholesome experience of innovating and developing products that can be commercialized and, hence develop a stronger set of skills for future jobs.

This model is not without its challenges. Managing students on development projects is harder than managing professionals. The time and effort put in varies from one student to another, as the demands of a live project are more than a typical academic project. It requires high dedication from the students and their ability to connect with needs of rural customers. Though this model can be strengthened further and requires gate checks to ensure its success, it certainly is a prototype pathway for bringing social innovation in India's innovation ecosystem and is an example of converging 'problem' and 'solution' spaces.
A. BACKGROUND OF THE CASE STUDY

The concept of entrepreneurship has a long history in the business sector. A major theme has been the creation of value through innovation (Drucker 1985). As applied more recently to social concerns, the concept has taken on a variety of meanings.

While authors believe that all approaches to social entrepreneurship have considerable utility, and without digressing into the meanings and concepts of Social Enterprise, they are particularly interested in the perspective that emphasizes social entrepreneurship as:

a. Innovating for social impact. In this perspective, attention is focused on innovations and social arrangements that have consequences on social problems. Social entrepreneurs are focused on social problems, and they create innovative initiatives, build new social arrangements, and mobilize resources in response to those problems rather than the dictates of the market or commercial criteria (Dees 1998).

b. Catalyst for social transformation that creates innovative solutions to immediate social problems and also mobilizes ideas, capacities, resources, and social arrangements required for long-term, sustainable, social transformations (Ashoka Foundation 2000).

Social Enterprises depend on two resources to fulfill their missions. One, of course, is money. The other resource – just as vital but perhaps even more scarce – is Human Capital. This case deals with creating initiatives to reconfigure existing resources, i.e. the talents, for more effective or wider delivery that are imperative to serve wider populations (Uphoff Esman & Krishna 1998).

This case study also reveals the eco-system in which the practice takes place and the community of individuals and organizations that share an interest in advancing this practice. It includes resources such as financial, human, social/political, and intellectual capital essential to the success of social entrepreneurs; and the environmental conditions (such as public policy and politics, media, economic and social conditions and related fields) that could support or undermine the practice of social entrepreneurship.

This case study demonstrates a model for social enterprises to tackle the challenges of talent (human capital) acquisition and social innovation. (As seen in Figure 1)
B. A SOCIAL ENTREPRENEUR’S WOE

“Do you have any tips on how to attract talent to a social startup business?” was Mitesh’s question to one of Villgro’s board members who was also an HR consultant. Mitesh’s enterprise, SEED, is a US-based for-profit social enterprise with a mission to increase incomes of rural farmers by developing affordable and sustainable products and services. They do this by developing products for productivity for 1-acre farmers. He was looking for tips to help grow his team with more operations officers and engineers. The response he received was, “It’s not easy and there’s no short cut. You have to assume that people are with you for a short time only to gain knowledge and experience and will then move on. Assume that 20% of the workforce is dispensable and try to recruit with this perspective”. Employee turnover was not even an issue that he was facing. Mitesh’s problem was not being able to find people to hire.

The month of May 2012 was a busy time. SEED had closed on an investment deal in its first week since it had demonstrated and piloted a few prototypes in Bangladesh. This money now would give the business the much-needed impetus in delivering its first product as well as in building a team. However, 5 months had passed and Mitesh was not close to hiring a single person.

Two factors intervened in hiring potential talent for SEED - people were either looking for higher salaries that would match any multinational corporate or they were so highly experienced in one skill set that they were
not capable of thinking outside of the box. Though SEED was capable of paying salaries to hire talent, it also needed its candidates to think innovatively, to be knowledgeable of the social context and hence apply their experience in innovative ways for rural markets that SEED operated in. But, Mitesh was unable to find the right talent or experience-to-salary ratio in the candidates that he interviewed. Recently graduated engineers and MBAs were looking to pay their student loans off and hence were looking for well-paying jobs especially in the IT sector. People with 3-4 years of experience had worked only in one department the whole time and were not knowledgeable about other aspects of the business or technology. They were too vertically entrenched to fit in a startup environment. There wasn’t a single candidate who worked on innovation or horizontally within a company.

SEED, being a technology based social startup, needed people who could develop new ideas, generate new ways of doing the same thing i.e. be creative, and play multiple roles within the company. This was the first time that Mitesh came to realize that although entrepreneurship was a growing trend in India, it wasn’t however part of organizational DNA. Engineering and Technology talent made up 7% of India’s 5,090,799 strong fresh talent pool in 2012, according to consulting and research firm Knowledgefaber (Basu 2013). This stream was expected to grow at a compounded growth rate of 6%. So while there was no dearth of generic talent, there was a lack of an innovative workforce suitable for startups, particularly, for social enterprises.

Therefore, the only ideal candidates were people who worked in other startups, or people who were looking to change their careers, or those who had retired and wanted to work not for money, but for the continuance of applying their skills. Typically, the most experienced talent in the social enterprise industry comes from outside India i.e. either returning Indians or Foreigners, who are incentivized by the need to create impact in the lives of the poor and are interested in applying and growing their skills in this space. However, this would have required SEED to pay for additional costs of accommodation, which was high in cities like Mumbai.

The most ideal solution that Mitesh could see was to grow or nurture local talent. This would work best, if a workshop or lab space was available that would also serve as a workshop-cum-office space. This meant that typical incubator spaces were not ideal as they provide only office space. Therefore, a co-engineering lab or a common workshop space seemed ideal. He also knew that talent could be nurtured only if they worked on specific projects instead of working on the entire product. This way, a broader base of talent could be recruited. Eventually, some of these engineers could be nurtured into ‘technopreneurs’, i.e. engineers becoming partners in the business.

SEED was uniquely challenged in that Mitesh was its only working member and most of the technology development took place at his US University. He therefore would have liked to see some of his new hires become partners as well, thus taking ownership in the success of the business.

It was almost impossible to achieve all of these simultaneously. There were similar organizations and institutions that inspired this idea such as The HUB (USA), a co-working space for entrepreneurs and GYAN (Ahmedabad, India) that commercializes technologies developed by rural innovators. However, he hadn’t come across the concept of co-engineering labs or a setup where engineers were trained to be entrepreneurial. There were many examples of technopreneurs coming out of IITs (Indian Institute of Technology)These engineers were provided with the university’s lab resources as well as incubation spaces. But such a system was non-existent in institutions other than the IITs in India.
To help develop his idea further, Mitesh then called on Sunita, Senior Director and co-founder of the National Entrepreneurship Network (NEN) that works to create and support high-growth entrepreneurs, driving job-creation and economic growth in India. NEN partners with academic institutes to help them build an effective and a vibrant entrepreneurship ecosystem on campus to develop and support entrepreneurs. Sunita suggested exploring an innovation program that NEN had begun working on with their member institutes funded by the Innovation and Entrepreneurship Development Centre (IEDC) scheme of The National Science & Technology Entrepreneurship Development Board (NSTEDB), Government of India to promote technology entrepreneurship. She further recommended partnering with Sardar Patel Institute of Technology (SPIT), an NEN member institute, which was IEDC funded and was in the process of building their innovation program with NEN support. It also had good infrastructure and students with strong technical knowledge combined with a curiosity for entrepreneurship.

C. LIGHT AT THE END OF THE TUNNEL

This was the beginning of an innovative pre-incubation node since the first time the idea was proposed 8 months back. The SEED-NEN-SPIT collaboration brings into focus a model that helps students direct their engineering talent into solving real-life challenges for the poor. They also develop their sense of product-for-market realities while receiving exposure to the spirit of a startup enterprise. This model combines the competencies of the three individual entities to develop specific skill sets in the students, to help provide insight into innovation, product development and business concepts.

This model incentivizes students to develop products or product accessories out of project ideas. It helps nurture their ideas into marketable solutions by helping them apply their ideas practically and therefore, building their confidence as engineers. The model also gives them knowledge on how to sell their products or who and where their potential markets are and therefore, provides appreciation for customers’ needs. The social enterprise, for the time it spends in guiding students, receives a working prototype, which it can then demonstrate in the market and then commercialize. Since the students developed the prototype, they become potential hires for the social enterprise. The students thus have a good placement opportunity readily available upon graduation.

This model thus helps find the right talent while it also develops this talent to think innovatively and prepares them for the challenges of working in a social startup.

The way this model works is that the technical institute brings student teams together and floats a few project or product ideas proposed by the social enterprise. The interested teams pick up an idea as their final year engineering degree project. Alternatively, students can also propose their own ideas, which they work on, if it is of relevance to the social enterprise. The social enterprise then provides technical help and direction on prototype development. During the project, NEN exposes these students to entrepreneurship through workshops, business plan competitions, games and exercises, to gain knowledge and skills in starting a venture. The students are encouraged to think like entrepreneurs and gain perspective on practical, commercial value of innovations which, otherwise may only remain as prototypes. The emphasis is on assessing the demand, the opportunity, and the markets and getting customer feedback in order to design better and develop a marketable product while creating value for the customer and the venture. Students who show exceptional talent qualify to join the social enterprise at the end of the project and lead the commercialization of the product.
The conversation between SPIT and SEED led to two student teams taking up a project each. One team is developed a biogas digester, while the other team developed sensors to monitor soil pH. The project period was divided into two phases - the first being the concept phase and the second being the prototype phase.

The goal for every student team was to first come up with the technical concept, which would be a theoretical solution. It would be developed after multiple iterations of innovative thinking and discussions with the social enterprise. Once the concept was approved by the social enterprise, the team builds a working prototype of their solution. If the concept was not strong, the project did not move into the prototyping phase. As a result of this vetting process, only one project out of the two was approved for the prototyping phase. This vetting process was necessary to ensure the success of the projects into product solutions for the social enterprise. It also ensured that the students were not wasting their time on ideas that customers didn’t want. The project that was chosen used an innovative process to create biogas using farm waste biomass in a much shorter time and reduced dependency on fossil fuel by saving 25% of diesel consumption. This concept was developed because of the students’ passion for renewable energy. The students spent a lot of time researching the idea, reading scientific journals and articles and making calculations to check the theoretical feasibility of the idea. They were also constantly guided by Mitesh to think innovatively, which helped them arrive at a product idea that had market potential and was patentable.

The advantage of this model for the institution is the opportunity to showcase successful student projects that can either be patented or commercialized or both, to their patrons and future students. As a result, the selected project had 3 new students from the third year batch join them and who will continue to work on this project into their final year. For the social enterprise, this becomes a cost effective way to develop new products and hire talented young engineers. For NEN, this was an opportunity to enable the most desired networking and learning from real entrepreneurs to its stakeholders, the institute, the faculty and the students.

D. THE GENESIS OF THE PRE-INCUBATION NODE

Entrepreneurs are not born. There exists a misconception that ‘talented’ individuals with knowledge or insight of business go on to become entrepreneurs. Entrepreneurs however, are nurtured. They are given the tools, knowledge and skills to start businesses. Therefore, they can come from a variety of backgrounds such as engineering or art or social sciences. What is required is an environment that encourages them to explore their ideas and the resources to develop these ideas into businesses.

In India, entrepreneurial role models either come from business families or have had prior work experiences. Entrepreneurship is seen as a road of hardship and not as a path to building careers. For a lot of people it requires knowledge and understanding of business and finance, which would only be possible with an MBA degree. Moreover, the capital required to start companies is usually only provided by banks who are least willing to take risks, and so need collateral in the form of existing assets such as a home or a piece of land or an existing business. But this is changing slowly and we are beginning to see more entrepreneurs starting ventures early in their careers.
This trend is most prominent in the IT industry and in premier engineering and technology colleges. Startups in the IT industry are proliferating and successful mainly because they do not require large capital investments compared to industries such as bio-tech, medicine or agriculture. An engineer needs to only invest in a few computers to develop software. Besides, the reason that engineers in institutes like the IITs pursue entrepreneurial ventures is because there is sufficient supportive infrastructure - like the incubators within the campuses and access to investors willing to fund their ideas. This means that these fresh graduates work on projects they are passionate about and are able to commercialize them. Venture capitalists or incubators are willing to take risks and don’t require entrepreneurs to provide assets in exchange for the money. Technology in the form of patents is the asset they invest in. What works for the IT sector, needs to be replicated for the social enterprise sector. The resources and ecosystem that institutes like IITs provide their students have to be replicated in several others.

For SEED to hire talent that had both an entrepreneurial mindset and creativity, a model that featured these above-mentioned benefits had to be replicated, i.e. perceived risks had to be lowered, similar resources had to be provided and aspirations had to be encouraged.

The SEED-NEN-SPIT collaboration does just this. The pre-incubation node formed by the three organizations thus provides a case study of how other social enterprises or institutes could achieve the same results. In the pre-incubation model, SEED provides students a job opportunity and a chance to explore their passion. SPIT provides the resources that the students need, such as faculty support and lab space to conduct experiments as an extension of the curriculum. NEN encourages and nurtures the entrepreneurial spirit within the students and supports SPIT to evolve their entrepreneurship ecosystem and program. The node reduces risks associated with following one’s passion or pursuing a non-marketable idea and instead, brings familiarity and comfort about entrepreneurship early on, while also providing funding for developing the prototype(s).

This pre-incubation node, while providing similar opportunities to students as an incubator, does with a difference. Its association with an operating business provides resources for students to develop into entrepreneurs without risk, to test out their idea before launching their product or venture which technology incubators normally do not provide. However, the flip side is that students are not exposed to faculty research or the latest technologies, as could be the case within premier research universities. The social enterprise makes up for this lack of research experience and knowledge by helping them connect with the market ahead of the launch of the product, thereby reducing the risk of product failure.

It took SEED six months since the start of the discussion with NEN to put this model into action. NEN helped identify the right institute to work with, based on the infrastructure, campus innovation ecosystem, faculty leadership and management support. It also required that the faculty be NEN-trained to gain their appreciation and trust about market realities so that the same knowledge was transferred to the students. With the strong support of the Principal Dr. Prachi Gharpure, SPIT became our institute node partner. Prof. K T Talele, who is a NEN-trained faculty and the lead faculty for the IEDC for the past two years, then identified and selected the right students for SEED’s proposed projects.

Finding the right partners to form the node is important in order to provide the necessary benefits. The main
reason SPIT joined hands with SEED was because other entrepreneurs and industry professionals were coming up with only ideas or monetary assistance to develop prototypes in the laboratory. In comparison, Mitesh approached them with the concept, technical knowledge and mentoring support to ensure that a product could evolve from the prototype. Moreover, the product would be developed based on results from field-testing rather than just from academic lab tests. This opportunity also brought the potential for the institution to develop patentable and reputable products.

For NEN, providing the students an opportunity to develop innovative product(s) with direct inputs from an entrepreneur was in synergy with their approach of providing real world experience in entrepreneurship programs. From their experience of working with technical Institutions, they saw this model as a solution to bridge the gap between innovative products coming out of engineering colleges (in some cases just shelved as student projects/prototypes only) and the students’ lack of understanding of customer needs or applicability of their innovations. (As seen in Figure 2)

**Figure 2.**
Pre-Incubation Node Characteristics

![Diagram of Pre-Incubation Node Characteristics](image-url)
E. OTHER SIMILAR PROGRAMS - INSPIRATION

The knowledge of other similar models in the US and India inspired this pre-incubation node. Mitesh, during his days as an MBA student in the US, saw multiple businesses come out from his university as a result of industry-academia collaboration as well as a matching of interests and competencies. SEED has its origins at Colorado State University, USA, where many successful social startup enterprises have their roots. The university and its various departments, specifically the engineering and the business departments, support student-led endeavors and business ideas through various engagement models. The most successful of such an engagement model is the one where two engineering students who worked on an innovation challenge were encouraged to apply their innovative idea to solve a social problem of pollution. In this case, the engineering and business professors joined the students to start the business. This set a precedent for other businesses to use the engineering lab facilities and the business school knowledge to develop new products and setup businesses simultaneously.

Similarly, IDDS (International Development and Design Summit) is an inspiring program run by MIT. Here, practitioners and experts, students, and faculty from various backgrounds such as engineering, design, education, etc come together on location in developing countries like Ghana or Haiti. They conduct month-long workshops to co-design engineering solutions with the locals using technical implements and tools available in their villages. This experience forces students to use their skills and crude rural tools to develop innovative solutions to solve problems of sanitation, energy, health, water, etc. During the course of the month, some students develop commercially viable products and move on to start social businesses. The advantage of this program is that it is a short and quick way to excite and recruit talented individuals. However, on the flip side the issue of people on the project team being from different countries is a challenge.

In India, the pre-dominant model for technopreneurship in academic institutes has been through Government funded Innovation and Entrepreneurship Development Centres (IEDCs), Science and Technology Parks (STEP) and Technology Business Incubators (TBIs) under the NSTEDB.

The Government has therefore laid-out and built the infrastructure required for mainstreaming new ideas and technologies. While, STEP has been more successful of the programs, since it reduces business risk by providing a working space to existing businesses, IEDCs encourage student innovations and fund prototype development. This helps build the pipeline for startup ventures to be incubated in the STEP or TBI if such incubation infrastructure exists in the institute. Thus, TBIs and IEDCs have helped nudge engineers to start their own technology businesses although almost none of them are in social innovation space. These government programs help extend the reach of innovation and technopreneurship to a local level where individual engineering colleges and institutes can participate. In this case, SPIT being an IEDC funded institute was one of the decisive factors for its selection as a pre-incubation partner.

The incubators associated with universities offer both tangible facilities as well as mentoring and networking support at a nominal cost to young startups. Mature institutions like IITs, PSG College of Technology (Coimbatore)
and Vellore Institute of Technology, Vellore in Tamil Nadu also provide Pre-incubation support. According to them, it is important for such support as it helps them right from conception of the idea, refining the technology, understand market reality; to writing business plan or project report which is mandatory to seek incubation support. The plan or report also serves as an acid test to check the student’s interest in building the business.

The advantage of such incubators in the educational institutions is multifold to the technology entrepreneur. They get the domain expertise from the faculty, get students as interns in the startup, and receive legal advice for patent protection, network with industry and get access to funding. These incubators also have credible connections to venture capitalists that can invest and further grow the business. So, the entrepreneur stands to gain more in various fronts necessary to start and grow the venture other than solve the talent or human capital issues.

Apart from these incubators, there are institutes like the Periyar Maniammai University with PURA Project or faculty like Prof. Amit Gupta who are working in their individual capacity with the Department of Science and Technology support on innovative projects to promote social innovation and use student talent. Challenges however exist in making these programs successful. These include an engineers’ lack of knowledge and education in starting companies or understanding markets, as well as a lack of awareness that such programs exist. Non-governmental and non-educational entities such as Acumen Fund, Villgro, Dasra have also come up with innovative ways to recruit talent. They have instituted a fellowship program where talented individuals or fellows work for the organization for a certain time period. New fellows are sought after every cycle. The fellows work for no or minimum pay but their accommodations and travel expenses are covered. Some of these fellows do get hired by the organization. However, for the most part, this program helps the organization conduct its business without having to pay for full time salaries. Most of the fellows are recruited from the US or Europe. Therefore, they almost never stay back in India but instead this serves as an opportunity for them to experience this sector and use it as a stepping-stone to get into development jobs or an admission in MBA School.

Therefore, this pre-incubation model developed by SEED-NEN-SPIT, while adapting features of these existing programs and models, helps tackle some of their challenges as well of finding local talent, thinking creatively and understanding rural customers.

F. PREVIOUS SUCH ATTEMPTS OF SEED AND WHY THEY FAILED

It had been a year since Mitesh moved SEED’s operation to India before he approached NEN and formed the pre-incubation node with SPIT. However, before this happened, he had tried various other ways to grow the team by connecting with various institutions and technical incubators with no success.

SEED joined the co-working space in Mumbai, called Bombay Connect (formerly The HUB) to use it as an office space. As the space is also used by several other social businesses, one gets knowledge and information of the sector and learns about the challenges and solutions that every entrepreneur has. It seemed therefore, also
to be the right place to look for teammates. However, it turned out that none of the resident entrepreneurs or
businesses were engineering oriented and most of them turned his attention to the IITs as the common place to go
to look for his requirements.

He immediately explored his options at IIT-Bombay. He visited SINE, the incubator in the campus to understand
how it functioned and to explain his requirements. He learned that to be a part of SINE, the business needed to
have some root to IIT-Bombay, where either the entrepreneur was presently a student or an alumnus or had a
faculty on its board/team. Moreover, SINE only invested in equity into businesses, which meant that one’s business
had to have shown proof of market and/or shown some sales. Two revelations came out of this conversation; one
that SEED was still a startup developing its product and hence wasn’t ready for this type of investment and the
incubation; and second, SINE’s business model wasn’t setup for social startup businesses like SEED.

During the conversation with SINE, Mitesh became aware of another department within IIT that took on product
development projects called CTARA (Center for Technology Alternative for Rural Areas) as well as an innovation
design facility called IDC (Industrial Design Center). He interacted with some of the faculty members and staff of
both these departments in order to learn more about their work and ways to collaborate. However, no positive
results came out of these visits. The faculty at CTARA could only pick up such a project only when the semester
started and if any of their students were interested in it. A new semester was at least 6 months away from starting.
The IDC only did projects pertaining to bamboo. This left Mitesh with no options at IIT-B and the only thing left to
do was to explore the other IITs.

Mitesh then extended his search this time with another incubator within the IIT-Madras (Chennai) campus called
RTBI (Rural Technology Business Incubator) and as the name indicates this incubator catered to social businesses
specifically. The incubator was modeled to provide office space to businesses and other resources and did not
necessarily make equity investments into the businesses. However, access to lab spaces were not part of the deal
and this would only be possible if any of the faculty was interested in the project and wanted to take it up as a
class project or their individual research project.

Besides looking into academia, Mitesh also explored to collaborate with other social businesses that shared a
similar social mission and were more matured in their growth and experience. One such organization, SELCO,
had recently started to grow its objective of providing rural and urban poor with alternative energy or affordable
means to earn a living. They started setting up technology incubation centers across the country with each center
focused on specific sectors or demographics. SELCO’s Ahmedabad lab was one such center whose director showed
interest in SEED’s work and arranged for Mitesh to visit their facility. From the perspective of competencies this
was a good match. Together, they explored various models of engagement including one in which Mitesh could
offer his technical knowledge and product development skills in return for developing SEED’s products at their
facility. But the only reason this collaboration did not go forward was the requirement of SELCO management for
anyone associated with them to be located in the same city as the center. This was not possible for Mitesh, as his
family was already set up in Mumbai. Even the option of Mitesh traveling weekly between Mumbai and Ahmedabad
was not acceptable to them.
Thus, a full year went by in exploring these options and talking to several other similar institutions and incubators. So how does a social enterprise not affiliated to any academic institution, but keen on developing industrial products for social impact and having limited or no funding get access to the same talent that other businesses with investments and roots to research labs/institutions have? Mitesh was looking for a setup similar to his university in the US, where all the product development work for SEED had initially been done. Now, looking for a place where similar development work could happen on future products was turning out to be a challenge. The collaboration with SPIT excited him because it not only solved his challenge of hiring potential engineering talent for his startup, but also provided the additional benefit of access to infrastructure resources that he required.

G. PROJECT DEVELOPMENT SO FAR

The figure below illustrates the sequence of the project stages and the current stage of this project and pre-incubation node. Among the two student teams working with SEED, one team has successfully developed a product concept and is currently developing a prototype. The other team’s project has been shelved as it proved infeasible to proceed further with the idea when validated with the potential customers.

Figure 3.
Pre-Incubation Node Formation and Project Development

H. THE RECIPE FOR SUCCESS

The specific problem here was the need to find the right talent at the right price. In addition, the problem of access to resources such as prototyping space and lack of (startup) work experience that involves thinking creatively, and knowledge of markets and customers were ancillary problems to address. This collaboration between SEED-NEN-SPIT provides a framework for how similar entities could come together and form a pre-incubation node to solve such issues for startup social and/or technology entrepreneurs. The pre-incubation node, when properly
implemented, creates a breed of graduates who are not only creative executors of product development, but also understand the importance of how their products help improve their customer’s lives. By the time these students graduate, they would have already worked collaboratively with an enterprise and if successful with their project assignment(s), they would have also been recruited by the same enterprise.

The reason this collaboration node between SEED-NEN-SPIT came together and worked is primarily because of the networking and connect enabled by NEN among academia and the entrepreneur community. Without a binding agent like NEN that invested in building the entrepreneurial ecosystem, the collaboration between SEED-SPIT would have been more challenging. NEN understood how to match SEED’s needs to that of SPIT. In addition, it was the relationship of trust that SEED-NEN and NEN-SPIT had developed that brought confidence in each other’s ability to deliver on the goal they shared.

Collaborations between private businesses and institutes do exist in general. However, the difference this collaboration brought for SPIT was the opportunity for students to develop a product with knowledge of the market and the customers. Besides, SEED was more involved than most private businesses in imparting product development skills. Finally, this collaboration gave the institute an opportunity to co-own the intellectual property rights that came with the product. The benefits from this collaboration with a startup far exceeded the benefits of working with any other large corporate.

This collaboration was not dependent on external funders. Here, both SEED and SPIT agreed to provide an initial funding to help the students develop prototypes. During the course of the project, SEED helped to move the project forward and incentivize the students by paying for their incidental expenses that was related to project work.

Two factors were essential for the success of the project
(i) The input and continuous interaction between the entrepreneur and the student team, and
(ii) Support from the college.

The initial meetings of the students with Mitesh were the most crucial as he described and setup the technical conditions and limitations. He provided them with insights on the intended consumer such as their socio-economic backgrounds, their occupation, availability of resources and hence the needs that weren’t being met. He also reset the students’ expectations on what the consumer was willing to pay for such a product and the reasons for it. The key objective was to align the vision and objectives, and internalize that the product was being developed for rural farmers. He also asked them to engineer a product as if they were in the consumers’ villages with the tools and equipment that would be commonly available in rural areas. Armed with this information, the students were given specific direction to work on three focus areas i.e. size of the product (to be small), acquisition of raw material (from the waste) & cost (using cost control techniques). They began their work with intense primary research through interviews with companies in Pune and Gujarat and secondary research on existing literature available on websites and whitepapers. The campus and college authorities also supported them a lot in the form of availability of labs and use of resources after office hours including holidays.
I. LESSONS FROM THIS MODEL

A good first attempt and hence a unique and innovative model has been developed, triggered by the need and reward with the effort from all entities. However, there are areas of this partnership that still need to be worked on or given more importance. Therefore, there are challenges and unknowns with this model that exist and may get uncovered along the way.

This case highlights several options available to social startup businesses and existing infrastructure and systems that they can take advantage of. It also explains the reasons why many of these did not work for SEED including geographic location, the need to grow the team and to expand its product portfolio. Not every social business needs to take such a path. Even so, this case does show that a huge scope exists for developing newer models to grow ventures and a talented team while also fostering product innovation.

Innovation is defined as ideas generated within a set of constraints. And this is exactly what this case highlights with this model. This model enables and encourages any technical institute inclined to utilize its resources and infrastructure to pursue student projects in collaboration with market-facing entities that will help spawn new career opportunities and future entrepreneurs.

CHALLENGES

While this model does talk about the potential to expose students to develop innovative products and nurture entrepreneurial skills, the reality is that in its introductory year, more could have been accomplished. Therefore, challenges do exist in making this model successful.

1. Model Attributes

- Encourage Entrepreneurial and Business exposure – Students could be encouraged more to join peer groups or collaborate with their E-cells (Entrepreneurship Cells instituted by students of NEN member institutes). For instance, the biogas student team joined a peer group and participated in an event led by the Mumbai Social
Entrepreneurship Meetup group. Their participation led them to meet other entrepreneurs developing similar products and through this connection they visited a biogas plant at Tata Institute of Social Sciences (TISS) and learned much more about biogas generation. Such peer groups are necessary to maintain interest in their project, and help with their awareness of the business of developing products for customers.

Through the E-cells the students could participate in activities like entrepreneur talks, workshops, competitions, startup fairs, e-summits that help increase awareness and knowledge of starting businesses. Some of these activities also require forming teams for mock venture exercises or programs such as ‘campus-company’, which require them to setup real businesses on campus. Real world experiences such as this help them gain understanding of pitching business ideas, developing business model and a business plan, building a start-up team, raising money, managing finances, etc., all that would help build entrepreneurial skill sets. For their participation in these programs, courses, workshops, and mock experiences, students should be rewarded with certificates and / or credits to incentivize their efforts.

**Faculty Role –** Defining faculty role clearly is necessary. Some might limit their role to being just facilitators, while some could be deeply involved in the project itself. While there is no expectation in this model for faculty to be involved in the projects, there is however a need for faculty to be co-project managers and a mentor (technical and / or business). During the introduction phase of this model, SEED has been the project advisor and manager. However, managing a business is not the same as managing students and these students cannot be held to the same expectations that a startup business runs on. Therefore, a faculty co-manager is required to ensure that project expectations and timelines are practical and realistic considering on-going academic activities as well. For this reason, whenever students developed a set of activities and timelines in collaboration with SEED, they often failed to meet them. With a faculty co-manager, the faculty can regularly check into their work and progress. Sometimes if bottlenecks showed up in the form of requiring college letters or permissions, immediate action could be taken. In the present model, SEED would inform the college faculty of bottlenecks if and when the students made them aware of. This delayed the progress of the project as per the desired timeline.

**Funding –** Not all startup organizations or academic institutes can put forward funding for prototyping. Depending on the project, some prototypes need more money than others. Therefore, this model could potentially fail if additional funding is not applied for during the conceptualization of the project.

### 2. Talent Potential

**Attributes –** At first it seemed that it was essential to select students based on their academic excellence. Higher grades meant better talent and so potential hires. However, they soon came to realize that this could not be the only criterion used to select students and teams. Students who can ask more questions, whether technical or not, were most likely to succeed and a better match to the team. This meant that the student was highly engaged, and interested in the project. He/she was more likely to fit into the business as a team member, because by the end of the project they would know the most about the business and the product they were developing. This was the fundamental difference between the two student teams at SPIT. The project that
had students who excelled academically had been shelved and, the project with the most involved students successfully developed a product concept and is currently developing a prototype.

• Communication - Indian students grow up in a system that does not support mistakes and they have a conservative approach combined with lack of forthright communication skills. This behavior is completely contrary to the nature of a startup business, where mistakes are encouraged and is almost a requirement in order to succeed. Therefore, these students are not forthcoming on technical challenges they may face or even issues that are academic or familial or societal. Under these circumstances, students will withhold such information or stop all forms of communication whether via telephone or emails and the only time it would come to everyone's attention is when the project is delayed. Even after the project started, they took more time to understand the scope of the project and/or the extent of the work as they were not upfront with their queries and doubts.

3. Project Success

• Academics versus Projects – A live project requires a lot more research and time as compared to a classroom project. A student should not have to choose between giving time to either their studies or homework or to the project. It therefore, becomes necessary to align the time required for projects with academic deliverables. If possible, exceptions should be made for students on such projects from their respective course instructors.

In addition to this, these live projects should qualify as final year project deliverables. Else, students end up doing two projects and are spread thin on their time. The students had excessive project workload as they were working simultaneously on other academic project deadline. Such additional workload does not incentivize students and leads to project failure.

• Align projects with student interest – Projects with focus on topics that are of specific interests of the students will have more chances of success. Such students will not need much in terms of motivation to complete the project and to come up with innovative solutions. They will enjoy the technical challenges and will work to surpass obstacles no matter how busy they are with their studies.

• Exposure to startup environment and business needs – Social enterprises could also provide exposure to the team by including them in their regular team meetings or brainstorming sessions so that the students feel and experience being part of the larger team and appreciate their role. The students could also be asked to travel to field visits occasionally. For instance, SEED organized a meet up event where all of its project teams were asked to make a presentation to others and to educate everyone on their work. The students got to interact with the other team members and learned more about the organization, like understanding its mission and business vision. Learning what others were working on gave them an insight into other aspects of the business and the people behind it and therefore appreciated the opportunity provided by the pre-incubation node.
CONCLUSION

Startup social enterprises need local, talented individuals in order to be successful. However, in developing countries like India where monetary incentives and career growth aspirations are difficult to meet and attract skilled people, a social enterprise in its infancy may find it almost impossible to attract such individuals and grow its team. This case highlights the difficulties and challenges that social enterprises could face when looking for skilled engineers or an operations team. The social enterprise sector requires that its team members think and perform creatively in order to create impact in the unmet needs of the poor who are limited by their socio-politico and infrastructural conditions. So a skilled individual should be experienced enough in order to also be innovative in their solutions-finding approach.

Most businesses, corporations and organizations therefore seek to employ talented individuals and further nurture such talent. While directly employing talent is the cheapest and quickest way for a startup business to grow, there are risks associated with such talent such as high turnover rate. On the other hand, spotting potential talent and nurturing that talent is a time consuming and expensive process. But such homegrown individuals are then driven by passion and the mission of the enterprise. Such and other constraints led to the social enterprise highlighted here to take the latter approach by collaborating with other organizations in order to compensate for competency, time and cost. In the process, a new model that serves as example or inspiration for other startup social enterprises has been created and showcased.

This model is a Pre-Incubation node that the organizations SEED, NEN and SPIT form to nurture engineering student talent to develop innovative products for rural customers in India. The model provides students with an opportunity to develop a commercial product while understanding who and what the needs of the consumers are through entrepreneurial training and out-of-box thinking. Its features are exemplified by the project teams who were selected to conceptualize and prototype ideas as final year projects, thus giving them an opportunity to join the social enterprise upon graduation. Each organization has a role and responsibility within the node as well as benefits to gain in return.

The outcome of such a model is that (1) The social enterprise while building a working relationship with the students not only gets to hire a talented individual but also has an opportunity to develop a new product or product feature (2) Students gain a deeper understanding of developing engineering solutions to benefit and positively impact the lives of the poor and (3) Understand and acquire the skills/tools required to think and be innovative and entrepreneurial, such as innovating based on customer needs, identifying target customers, managing timelines, working in a team, developing a real time product to create social impact (4) The organization promoting and imparting entrepreneurship education is able to train students using a real-life problem or a need based on the mission of the social enterprise, and (5) The technical (or management) institute has the opportunity to develop projects that can be patented or commercialized.

Challenges still remain in making this model perfect such that it can be scaled and replicated seamlessly. Gaining student interest and training them is not easy nor are its outcomes uniform with every graduating class of students. Encouragement and incentives have to be constantly refined and updated such that they are meaningful for the students and at the same time have the desired results for the node collaborators.
This case is intended to inspire such models of collaboration and innovation between various organizations for meeting talent requirements. This may not be the best model but it provides details on how talent needs of social enterprises could be met in the most creative, innovative and collaborative manner leveraging existing resources and relationships.
REFERENCES

Ashoka Foundation (2000).
Center for the Advancement of Social Entrepreneurship. (2008). Developing the Field of Social Entrepreneurship.
Duke University. The Fuqua School of Business.
A. Definitions and Terminologies

• SEED: Small Engines for Economic Development
• SPIT: Sardar Patel Institute of Technology
• NEN: National Entrepreneurship Network
• NSTDEB: National Science and Technology Development Education Board
• TBI: Technology Business Incubator
• STEP: Science and Technology Parks
• IIT: Indian Institute of Technology
• CTARA: Center for Technology Alternative for Rural Areas
• IEDC: Innovation and Development Centre
• SELCO: Solar Electric Lighting Company
• RTBI: Rural Technology and Business Incubator
• MOU: Memorandum of Understanding
B. Engagement Agreement (MOU) + Process Steps

Memorandum of Understanding

This document constitutes a memorandum of Understanding (MOU) between The Institute Sardar Patel Institute of Technology (S.P.I.T.) located at Bhavans Complex, Andheri (west) Mumbai 400058, the Indian Team and the company SEED LLC at 1475 W. Winona St. Chicago IL 60640, the US team.

The company and the Institute have agreed to be associated with the sole aim of encouraging the student community to innovate in technology and to motivate them to become tech-entrepreneurs.

I) Description of Partners:

Indian Team consists of undergraduate third and final year engineering students along with the experienced faculty mentors from the Sardar Patel Institute of Technology. The institute is having well equipped lab for research and innovation and the teams of students are passionate about new research and development leading towards Entrepreneurship.

The US team brings the experience of developing technologies for rural farmers in South Asia. It is a social enterprise focused on designing and developing products for affordability and sustainability. Their role is to not only help in product design but also to bring the market realities/perspective during designing and prototyping this product.

II) Development of Application

The students of S.P.I.T. have shown great passion by getting involved in various projects and by showing their engineering capabilities. SEED being involved in technology focused on Agro-Water-Energy areas have expressed their desire to be associated with the students of the Institute for the projects in these areas.

In view of the above both the parties have agreed to work together with the roles and responsibility as described in this document.
III) Roles and Responsibilities

1. SEED will invest in projects to help them prototype the concept idea. This basically means that the institute and the students will have to showcase their final concept(s) and if accepted, SEED will be willing to partially fund their project in cash of up to Rs. 10,000 in equipment and materials and in kind through SEED's resources and networks including any market testing activities.

2. SPIT will fund the equal amount of Rs. 10,000 and any additional amount in case the Institute feels that this would help to bring the concept to the prototype stage.

3. The funding implies that the student project has entered the prototype stage.

4. Once funded, the students cannot work on any other projects.

5. Any intellectual property developed by the student either during the concept stage (with inputs or in collaboration with SEED team members) or once the project is funded will become property of the Institute and the company, i.e. the Institute and SEED will have joint ownership to the IP if filed by any entity.

6. The Institute will have to verify that no other entity (institution or organization) has IP rights that preclude this agreement. All equipment and material that is purchased will have the joint ownership.

7. SEED will have first rights of refusal and acceptance and ownership to any product development opportunity once the project is funded. The student or the institute cannot solicit property protection/ownership rights and/or business opportunities from external parties without permission from SEED.

8. Once funded, the student(s) will have to participate in any fundraising activity taken up by the company.
9. If the prototype is successful and SEED picks it up as a potential product for the company, the student will have the opportunity to join the company in a mutually acceptable engagement format.

10. If a student prototype is picked up as a product by SEED, then SPIT will help in providing incubation and lab space as per the terms and conditions of the T.B.I (Technology Business Incubator) to further develop the product.

11. If funding is achieved through other means, then neither entity is obligated to provide cash funding to the project teams.

12. The Institute agrees to allow the company to commercialize the prototype in due course and would release the ownership on payment of Royalty to the Institute, which would be mutually agreeable at that stage.

IV) Termination Clause:

This understanding is for the period of one year and has no binding on either party for withdrawing from the MOU at any given time during this period with any written intimation in advance. The Institute role is limited only for provide R & D support by involving its students and any Grant/Aid received for the related projects would be used for the purpose of R & D activities only.

| Signature: |  
| Signature: |
| 13/12/2013 | 25/12/2013 |
| Name: Dr. Prachi Gharbure | Name: Mitesh Gala |
| Principal | Founder/CEO |
| Sardar Patel Institute of Technology | SEED LLC |