Confederation of Indian Industry

Department of Science and Technology
Government of India

All India Council for Technical Education

Young Indians
WE CAN WE WILL

India Innovation Initiative

Opportunity to harness innovations for wealth generation and societal benefit

8TH INDIA INNOVATION INITIATIVE 2016

AN INNOVATION THAT DISRUPTS, REVOLUTIONIZES SOCIETY

Institutional Partners

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i3 COMPENDIUM

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CONTENTS

Background

Issues/Problems/Crisis lead to various thoughts in our minds, which give birth to ideas. When these ideas are expressed and acted upon they transform into solutions, discoveries and sometimes INNOVATIONS.

In today's competitive world, India needs to come up with innovative solutions to counter the global challenges and grow simultaneously to address the pressing needs of its billion plus population. This goal can only be achieved by empowering every individual in the country to think independently and take the risk in transforming their ideas into value propositions.

Innovation is a critical factor in the growth of a nation and empowers its people with the ability to solve their problems themselves at all levels- individual, industrial and societal. However, innovation as an input is of limited use if it is not available to all citizens. 'Democratization of Innovation' as a matter of access and opportunity is an important determiner of inclusive growth and development of a country.

With this understanding as its guiding light, Confederation of Indian Industry (CII) has been working with the government, industry leaders, funding bodies, incubators and other stakeholders to promote and inculcate a spirit of innovation in India and to encourage application of breakthrough technology / ideas in society. The India Innovation Initiative-i3, co-promoted by CII with partners such as Department of Science and Technology (DST) and the All India Council for Technical education (AICTE), Government of India, for the past seven years is a glowing example of such an endeavor, which encourages promotion and commercialization of innovation at all sections of society.

ABOUT

India Innovation Initiative (i3) is a national-level competition organized by the Confederation of Indian Industry (CII) in partnership with the Department of Science and Technology (DST) and All India Council for Technical education (AICTE), Government of India, with the principal aim of communicating and promoting science, technology and innovation among the masses, and commercializing potential innovations.

The Initiative also aims to expand the entrepreneurial ecosystem of the country by fostering the spirit of innovation and entrepreneurship among citizens who have the ability to think out-of-the-box and the boldness and passion to solve contemporary industry and social challenges.

This initiative is in line with the growing awareness in the country of recognizing and awarding prizes to spur innovation by incentivizing innovators (from urban and rural India) in the fields of science, technology and engineering to tackle key challenges in areas such as healthcare, sanitation, agriculture, energy, environment, engineering, IT and communications among others.

To address the needs of innovators from all walks of life – students, academics, entrepreneurs, professionals, early stage- start-ups - CII has created the platform of "India Innovation Initiative 2016" where innovators and entrepreneurs from all regions across the country are encouraged to participate, compete and get recognized for creating the most innovative solutions for various industrial and societal challenges. Through this challenge, a large section of industry, investors and incubators are invited to scout for the most novel solutions. The best solutions (socially and

industrially relevant) are then connected to the start-up ecosystem of business incubators, angel investors, venture capitalists and industry mentors at different stages of the innovation or business cycle.

Through its seven years journey, i3 has received over 6,190 innovations by students, teachers, scientists, researchers, professionals, rural innovators, entrepreneurs and MSMEs coming from all corners of the country. i3 has consistently grown in size and prestige over the years. Last year, the initiative received an overwhelming response in the form of 740+ entries.

The 7th edition of i3 2015 National Fair and Awards Ceremony was held on 4th December 2015 on the sidelines of the first India International Science Fair, organized by the Ministry of Science & Technology, Government of India at the Indian Institute of Technology in New Delhi.

Nine best innovations by individuals from diverse backgrounds including five students, one class VII drop-out and two PhD scholars in the field of healthcare, textiles, agriculture, food technology, electronics and products and services were conferred with the top awards of 7th India Innovation Initiative (i3) 2015. The winners were felicitated by Union Minister of Science and Technology and Earth Sciences, Dr Harsh Vardhan during the valedictory ceremony of the India International Science Festival (IISF) held on 7th December 2015 at Indian Institute of Technology, Delhi.

OBJECTIVE

The objective of the "India Innovation Initiative 2016" is to foster a culture of innovation and expand and strengthen the entrepreneurial eco-system in the country by sensitizing, encouraging and promoting students, professionals, independent researchers, grassroots innovators and early-stage innovative start-ups and facilitating commercialization of their innovations.

BENEFITS OF THE INITIATIVE

- Foster and promote a culture of innovation among Indian citizens.
- Showcase, communicate and popularize India's innovation prowess in Science and Technology nationally, especially at the student level.
- Reward successful innovators by connecting them to the entrepreneurial ecosystem of industry, investors and incubators.
- Empower young innovators, especially students, to innovate, create new ventures and start-ups as an alternative and viable career path by identifying and facilitating commercialization of innovative technological solutions.
- Provide solutions to various industrial and social challenges.
- Build a robust knowledge repository of past innovators, success stories and thought leadership on innovation and entrepreneurship.
- Promote building up of entrepreneurial ecosystem and generation of new employment opportunities.

AREAS OF FOCUS

- Agriculture
- Chemical
- Energy (including renewable energy)
- Engineering
  - Civil
  - Chemical
  - Electrical (including Electronics & Communication)
  - Mechanical
  - Automobile
  - Others
- Healthcare & Sanitation
- IT & ITeS (solutions in any field)
- Life Sciences
  - Biochemistry
  - Bio Pharma
  - Biotechnology
  - Dairy Technology
  - Food Technology
- Nanotechnology
- Robotics
- Transportation & Logistics
- Water
- Others

ELIGIBILITY

CII invites applications from Indian citizens, between 18 and 45 years that include individuals or teams from academic institutions, government laboratories, non-government R&D institutions and laboratories, incorporated early-stage start-ups, MSMEs and other non-incorporated entities with:

- Prototype or working model of an innovative product or technology, beyond the idea stage, solving at least one industrial or social challenge falling within the focus areas specified here.
- The potential to commercialize within 2-3 years.

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Thought Leadership

Thoughts, views and opinions of leaders on the challenges of the Indian entrepreneurial ecosystem

Institutional Partners

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Entrepreneurship, Employability and Innovation: Strands of Strength

By Kumaar Bagrodia

In India, the troika of Innovation, Employability and Entrepreneurship are now intertwined more than ever.

Enough and more has been researched and written about the abysmally low percentage of graduates in India that are employable by industry. Several skillsets have been found lacking across different fields of study. I would add areas like risk taking ability, imaginative thinking, innovative approach and entrepreneurial skills to this list.

On the other hand, it is now apparent that India will find it difficult to create the required number of jobs to accommodate this growing young demographic going forward, more so with industrial automation, machine learning and artificial intelligence gaining ground.

Frugal Innovation is a term now repeatedly used to describe India's success in innovating at lower than global costs in several areas from Mangalyaan to the Mumbai Dabbawalas. However given our sheer size and numbers, we as a country don't have too much to show in terms of large scale innovations in the commercial products space.

Entrepreneurship plays an equally important if not greater role in this. One could take a view that overtly focusing on just employability by

itself could also mean workers being skill ready for current jobs but we won't have so many jobs and we can't predict the future requirements of jobs that don't even exist. India will also have to focus on creating entrepreneurs as it goes on a war footing on improving employability. Entrepreneurs who will in turn also create jobs and innovate to find solutions to the several problems we have as a country and society. India will have to focus on concerted efforts in the area of Innovation and entrepreneurship from the grassroots level right up to the echelons of top R&D centres and corporates.

This would require amongst several other steps the government, corporates and academic institutions to work together on long term structural initiatives which could include:

Imparting critical skills from the early years in education to enable young minds to think imaginatively about problem solving, creativity, design thinking and innovation.

Foster a culture of thinking about innovation in a structured manner which can leverage current and future tools and resources available in India and across the world.

Providing greater incentives for corporates and institutions to devote time and resources to conduct R&D so that the best minds and cutting edge resources can be leveraged to generate solutions to problems.

Setup a dedicated system for Industry and Academia to work together for commercialization of technologies in a rapid and scalable manner and ensure that real world problems, experiences and knowledge converge with the latest thinking in academia. Promote a culture of accepting failure when trying innovative projects so that the ability to take calculated risks and creativity are not stifled in society.

Promote Intrapreneurship and corporate funding of ideas and ventures so that experienced professionals and those with ideas can be rewarded appropriately whilst increasing the innovative prowess of corporations.

Improve access to capital for driving innovative entrepreneurial initiatives and also incentivising lenders and investors such that the country not only has a good savings rate but also a good 'investment in innovation rate'.

I believe we have a lot going for us, now more than ever and we should as a country be able to galvanize into our action our tremendous zeal to prosper and win against the several odds that face us.

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Views are personal and do not represent those of CII, DST or AICTE or their staff

Social pullback from Start-up dream

An emotional challenge, difficult to overcome by many

By Ashish Jain

Start-up dream is now-a-days seen by many youngsters but not everyone ends-up with his /her start-up.

I happen to know a youngster, who passed out in 2015 from a prominent southern private engineering college. Let's call this youngster Pranav. He has been active in college fest, organizing activities for "societies" and getting "tech-app" made from his juniors. Highly connected with students, professors and evangelists from other colleges in the area, he had a dream to commence with his own start-up and even had firmed-up his ideas on technology and domain to venture into. On campus placements, he rejected four such offers, including from the big Indian IT companies and consulting MNCs. He knew, for sure, the challenges he was likely to face in his start-up. Usual ones were finding a team with same zeal and passion as he had, funding it, getting the product ready, competing against competition, sustaining the various ups-and-down of a startup and then making it big to succeed. He graduated and was ready for all of these challenges.

He was ready but his family was not. He has discussed the options with his parents before rejecting his campus placement offers, but parents were under pressure from the "society". Few relatives were skeptical of his choice in life and were not seeing the vision and life he was seeing for

himself. Anyone, Pranav or his parents discussed the idea with, brought the rejection of the start-up idea in favor of more established options of higher studies (post-graduation) or taking up a job.

Pranav isn't along. There are numerous graduates, hailing from middle-class, who are facing challenges even before starting their own venture. The society in India is yet to reconcile to what's-the-big-deal-to-failure mentality. Is it a big blow if someone fails in an experiment? What about the learning from such a failure?

I did a simple arithmetic of the options that are available to be engineering graduate, soon after college. Please allow me to exclude the outliers from IIT and IIM.

Based on latest figures, an engineering graduate gets about Rs 3 – 3.50 lakhs as his starting salary. Assuming everyone, who gets into a job gets an increment of 25% in the year 2 and 3 appraisals, 20% for the next two and 15% subsequently, as the base salary is growing and this percentage reflect the general 60% of the candidates who fit in the middle of the bell-curve. An engineering graduate gets about 11 Lakhs after about year 9, unless he reskills himself or switches jobs too frequently, with a cumulative earnings of Rs 61 Lakhs after 9 years of service.

Consider the same graduate going for higher post-graduation studies within India. He invests about 10 Lakhs in the fees and hostel and gets to start at about Rs 7 Lakhs. Assuming the same increment percentages as earlier, his CTC at year 9 is at 16 Lakhs, with cumulative earnings of 71 Lakhs over 9 years of service. If the same graduate had gone for higher studies abroad, he had to invest about Rs 40 Lakhs an would have been much better taking CTC of Rs 23 Lakhs (cumulative 76 L) after the same period.

			25%	25%	20%	20%	15%	15%	10%	10%	
	Option	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	
1	Job, Right now	3	4	5	6	7	8	9	10	11	
			7	11	17	24	32	41	50	61	Cumulative
2	Higher Edu India - PG (2 Years)	(5)	(5)	7	8	10	12	13	15	16	
			(10)	(3)	5	15	27	40	55	71	
3	Higher Edu Abroad - PG (2 Years)	(20)	(20)	10	12	14	17	19	21	23	
			(40)	(30)	(18)	(4)	13	32	53	76	
4	Startup - Failed, Join Job after 2 years	(20)	-	15	18	22	25	29	31	35	
			(20)	(5)	13	35	59	88	119	154	
5	Startup - Successful	(20)	-	40	48	58	66	76	84	92	
			(20)	20	68	126	192	268	352	444	

Consider starting a venture. What does it take for founders to start a venture and take it to a level recognized in the industry? He needs to build product (technology savvy), understand market dynamic including competition (marketing plan with branding), define go-to-market strategy (led sales), arrange funds (CFO role), hire and retain people (CHR role), manage organization growth, address regulatory compliances, etc. If this venture has made its presence, founders have learnt which no other course in the world can teach them! Innovative and modern outlook companies are constantly looking for such people who are not only all-

rounder, but also possess fighting spirit and attitude to solve problems as they come. It makes these founders in-valuable, whether they lose out on their venture or make success out of it. Anyone who fails still has a better market value and conservatively valued at 15 Lakhs as starting salary, if he had to resume job after venture failure. Not to mention, he is better off than any of the earlier discussed cases, even if he has burned about Rs 20 Lakhs of his own.

What if he succeeds? There is no looking back. What one earns is un-comparable to job that could have given. Pranav has been able to convince his parents to travel on this path.

If one argues higher education in India or abroad provides connect with fellow batch-mates and this can be leveraged for better opportunities in life. This is no-doubt a take away. However, this is much more explicit had one started his venture.

It is also pertinent to mention that business is not for everyone. Only some have the aptitude and attitude to take the risk and have the endurance to undergo the hard work physically and emotionally. So, for all those we are appropriate for it, startup venture is the right way to go.

It is time that as parents we support our wards to take the path less travelled and enable them to be the torch bearer for the generation to come, without compromising self-interest.

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Not All Those Who Wander Are Lost

By Kapil Mehta

There was a time when entrepreneurship was considered unconventional, offbeat even. It was for the dreamers, the outliers. It was for millennials who looked at life differently, who yearned to know the world better, for whom ordinary just wasn't enough. Perhaps the spark within these souls had been dimmed by cloistered office cubicles and protracted, uneventful meetings; their dreams and creativity most likely trapped by four walls and a computer screen. And maybe, entrepreneurship was their form of rebellion.

Entrepreneurship has never been considered a practical route. How can it be, without the promise of the bank balance tinkling just a little louder at the end of every month? And yet, in recent years, this unlikely tribe has only grown. Today, India is considered the land of rising entrepreneurship, and has secured a place on the world map as a mighty harbourer of entrepreneurs. It boasts of over 48 million ventures while the United States has clocked a little more than 23 million, almost exactly half that count.

At SecureNow, we've been part of the incredible entrepreneurial wave that has washed over the country in recent years. And along the way, we've made myriad discoveries that have changed the way we perceive people, customers and businesses. For instance, we have established that small businesses are willing to buy insurance from someone who does not have a long standing personal relationship with them, provided the fare being offered is relevant. We have found that these businesses are

not price, but value driven. We have demonstrated that fresh graduates can sell relatively complex general insurance, provided they have strong technology support. We have determined that underwriting, which used to take weeks, can be done in minutes. We have observed that a healthy dose of technology can dramatically increase access to small businesses spread across geographies and industries. We don't have all the answers just yet, but are working on it. It's a journey of discovery, and there are many answers yet to be uncovered.

While entrepreneurship has changed the face of the Indian economy in the last few years, entrepreneurs face a host of challenges in the current economic landscape. India has long been touted as the labour capital of the world. With a population of 1.3 billion, manpower should hardly be a concern, right? Right. But though there is abundant labour, specialised skills are few and far between. Take web design skills, for instance. Ironically, despite the internet business boom during the past couple of years, there has been a dearth of skill sets related to web design and UX amongst urban Indians. Even in the wake of digital India, these skills remain niche, and businesses struggle to find web architects who can deliver quality interfaces. It's not impossible to address this problem; not at all. In fact, India already has the infrastructure; it's just about tweaking it to suit the digital age. Institutions like NID and the IITs can be turned into digital centres of excellence. They can deliver comprehensive training modules on web design to empower aspiring designers. This will certainly help to fill the skill set gap that exists today.

Labour is a double-edged sword. While I've already spoken about how it can immensely impact a business, managing manpower is a concern for most businesses. Weak contractual agreements mean that employees are not legally bound or obliged to serve adequate notice in a company. The judicial process needs to be fortified to handle employee separations swiftly, and this can only be done if employer-employee relations are hived off from traditional courts. Appointing new employees can also end up being a cumbersome process for most companies. Background checks

are often futile, because little information exists about the employee on any online or archival platforms. It is imperative, in my opinion, that a common database be created by industry associations, to store key background information about employees across sectors.

Entrepreneurs are often challenged with respect to employee welfare when it comes to monetary deductions. Employee provident funds and ESI requirements entail mandatory deductions and employees see little value in them. I believe that making the provident fund optional across all income brackets would be more useful, and would allow employees better control over their finances. What better way to impart financial consciousness?

2015 saw the advent of the consumer-facing internet business trend in India. From food technology companies to online marketplaces, e-jewellers to home management applications, the internet became a labyrinth of consumer utility services. India has an estimated 375 million internet users and is the second internet market in the world, so it was little wonder really. Newspaper columns were reserved for which consumer services Internet Company snagged the latest round of funding, and who had been acquired by whom. In the process, businesses in commodities, financial services, consumer goods and healthcare, amongst others, were not spotlighted by the media. As 2016 sees these internet businesses consolidating, the hullabaloo that once surrounded them is dying down. It's the ideal time for the media to highlight businesses in other sectors. Today belongs to the companies who flourished, but did not receive media attention by virtue of the industry that they belonged to. Today is their day.

Another concern for businesses in India is tax. Entrepreneurs are perpetually combatting the implications of taxation on their business. Tax refunds usually take more than a year to get processed. It really makes you wonder why there is no automatic refund process in place. Wouldn't it be easier to have an established auto-refund process which

would refund the tax within 6 months in the absence of any queries? I think it's time the government put one in place.

Some industries in India are regulated. Telecom, food safety, insurance, power and pension are just some of these. The good news is that regulations can be a boon, because they prevent market failure. The bad news? They can also be a bane. Because these industries are so tightly controlled by the government, approvals can take months. Businesses have to wait indefinitely, resulting in a loss of time and resources. So what's the solution? Well, how about varying the degree of approvals required based on the size of the company? Simplify the approval process for nascent companies, and then bolster it as these companies get larger.

It's interesting that as entrepreneurship has become a buzzword in India, there has been an influx of foreign investment in the country. Foreign investors have grabbed headlines in the recent past for all the right reasons, while their Indian counterparts have shied away from investing in homegrown companies. Domestic investment is the need of the hour, particularly in FDI regulated sectors. By introducing incentives for angel investing, I am certain that domestic investment will see a rise.

It takes years of hard work for entrepreneurs to become overnight successes. Delve into the history of any entrepreneur and you will see failure, rejection and course correction in equal measure. It takes all three to make a great entrepreneur. J.R.R. Tolkien captured this best when he said "All that is gold does not glitter, not all those who wander are lost." Couldn't have been said better.

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"Rise Above...."

By Arun K Pathak

"No way Arun, don't take any risks at this stage of your life, be there wherever you are." This was the sincere and serious advice came from my network (family, colleagues and true friends) when I was speculating a new journey into entrepreneurship. Is this the advice you want to hear and live with, for rest your life? If "No" then move ahead for further insight into the article.

So what is the right stage and time to do what you really want to do in your life? Especially the entrepreneurial journey?

Being into IT consulting industry for almost 2 decades, fortunately I got the opportunity to greet, meet all age groups globally. Surprisingly, majority of the people in my network and certain age bracket are just superstitiously sticking and clinging in wherever they are. Completely into their comfort zone. Shockingly, this is the same lot which used to be highly enthusiastic and took the world by toe, are now just sitting down and waiting for what? The emotions and reactions which could clearly be sensed here - demotivation, hiding behind, thinking that age has passed, thinking of retirement, slowing down and not me! In this the most frustrating and devastating is that this is being preached to all, which comes out to be the wildest killer.

Probably this is the lot which has the tremendous need of handholding, guidance, re-energising vaccination (if it all, it exists somewhere). At times I really pity the situation, thoughts and mind-set prevailing in mid-senior

and even senior level leaders of these organizations. How are they really taking their organizations ahead in their respective capacities, when they themselves are so concerned, de-motivated and have big question mark(s) in front of them?

There is definitely a clear need to combine this “Experience” of this so called, self-proclaimed middle-age and “Enthusiasm” of the youth, to make it E + E = E2.

There are umpteen number of challenges in any start-up or in anything new being done. Probably the first and foremost is the “leap of faith”, it is exactly like jumping from the balcony of my house from first floor, which once I was never afraid of, so why am I now?

In past few years, the start-up landscape in India sub-continent has really changed drastically. Ever rising expectations, bigger sustenance power, global exposure, improving government policies, better money inflow, definitely the population growth and market availability and above all advent of Internet has been a big boost and game changer to this space.

Irrespective of age, class and segment of society we come from, here are few things which seems to be the major bottleneck and can make or break the beginning of the journey of a start-up.

Alignment - Network - though it is said that entrepreneurial journey is quiet lonely and aloof, but for sure this journey can never be accomplished alone. One needs to have a support (active & passive) from the closest network of people around, which is one’s family and friends. Be ready to face resistance from all of them, because they are also human beings, have the same fear and emotions which you have, but the only difference is you have decided to face and overcome it. So, it is your job to be able to formulate and help them understand and eventually help you.

Partners and the Team - trust, similar thinking brats, complementary skills, ready to fail and support each other in the hour of need. This is

the group and mind-set you need, though not that easy to find. Seek commitment not only in terms of mind and words but in actions too (for ex....get the money on the table, agree contractually).

Be ready to fail - Start-up space is full of frustrations, anger, self-killing thoughts, dejection, sleeplessness, hypertension, failures and what not. Is this how you really want to lead your life for next few years? Prepare yourself and get ready to live with it, learn and be ready for how to manage these emotions. The moment you start liking it, the real journey begins.

Plan for the best and be prepared the worst. This is the painful journey, you can't escape it. I see a direct similarity of this journey with "Pupa - Caterpillar - Butterfly" evolution.

Give time - Though there is no hard and fast timeframe for one to be successful or failure, but typically keep the horizon of 2-3 years. If you start getting success easily, then be careful and review the situation (easy success could be sign of quick failure).

So, it is not a beginning or an end, it is a journey where starting and even closing it down involves a cost, be cognizant of it. It is entirely your willingness, strength, will power which can make you to "Rise Now…." and "Rise above….". To emphasize and share my motto, listen to your heart, bring your guts together and as Nike says "Just Do It", but be careful don't be emotional. Indeed there are no short-cut to success. All the best.

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Arun K Pathak has got two decades of extensive global & corporate leadership experience. Has successfully led multitude of business critical & complex IT programmes across various domains. Is now on entrepreneurial journey, active mentor, consultant & visiting speaker to institutions & start-ups. INSEAD and IIT alumni.

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Challenges Of Entrepreneurial Environment

By Neeraj Kumar Singhal

Entrepreneurial environment, these days, is faced by multiple challenges. The advent of globalization, the fact that people today know more than they ever did and the tireless effort of people to deliver their aspirations to the best possible capacities is making entrepreneurship a complex exercise. The availability of funds, evolving technology space and a thriving domestic market are the key driving forces for the startup ecosystem today.

One of the key challenges that are posed in this arena is seeking, getting and offering funds. Angel investors often find it difficult to invest time and money in a business primarily because it isn't their full-time job, but is the side business instead. The new start-ups find it difficult to resist the urge to take too much equity in the start-up, and leaving enough for future investors to make sure that the promoter isn't diluted too much too soon. It is important for firms to remember that every business is not attractive to an investor or Venture Capitalist, and hence raising capital becomes a mammoth task.

There are tons of incubators and accelerators coming up every day, and in this water-tight competition, flow of funds from one pocket to another becomes a challenge in itself. Over the past two years, investors have pumped in huge amounts into a number of start-ups, most of whom either died their slow death or are waiting to grow at the mercy of series B funding. It is important to note that the valuations of start-ups don't change in a linear pattern over time. The start-ups must understand and

acknowledge the fact that only because it has been some time since they raised funds for Series A round, does not justify the demand for more money to trigger off Series B. To reach an increase in valuation, a company must achieve certain key milestones. What frequently goes wrong, and leads a company running out of cash, and unable to raise more, is that management failed to achieve the next milestone before cash ran out. Many times it is still possible to raise cash, but the valuation will be significantly lower.

A lot of the fund raising problem that startups face is also surprisingly because the investor that they choose to present their business case does not understand the spirit of the business or has not been explained the concepts well. It is therefore pivotal for companies to identify the right investor for them to ensure that the funding exercise doesn't fall back right at its start. Companies must also simultaneously work on an alternate plan to sustain their ideas in case of a dearth of funds or a weak initial traction.

Coming to the issues faced by institutional investors, there are more than 400 institutional investors registered with SEBI but alarmingly only a few of them are active. Apart from this, institutional investors have their own sector and stage bias which dynamically keeps changing. As a result of this, the level of trust and confidence on a nascent business idea is seemingly low.

The angel investors bring with them more than just money to the startup initiatives. They bring on board their share of valuable connections and experiences, which in turn help the startups get the right boost for their business. The angel investing market has been witnessing a jump in the last few years. Reportedly, Indian angels funded about $110 million in close to 280 deals last year. It was surely a good start, but they also expect the government to simplify procedures and reduce bureaucracy across the board. And, of late, they too are responsible for this funding crunch.

Yet another challenge that the young entrepreneurial environment is facing today is that of building, nurturing and sustaining a team. One mistake that most people planning to start a business make is to assume that team is the one which has like-minded people, people who think alike and take uniform paths. Actually, the best of teams are the ones which has a heterogeneous mix of people, different in the way they think, different perceptions, different modes but driven by one common spirit and goal. That's where disruptive and unique ideas evolve. Mediocrity does not breed excellence.

As far as teams are concerned, most start-ups find it difficult to rope in the right kind of people to handle the multitude tasks that the new business may bring in. A weak management team is an incredibly common problem that startups face. They are weak on strategy, poor in execution and low on morale.

But it is equally important for business brains to hire the right set of people to carry out different tasks. If one never hires anyone, they land up doing all the work by themselves. Which in turn would mean that they are busy building a job for themselves and not a business. On-shore or off-shore teams, both need a mindful selection and a clarity on the ultimate objective that the company intends to meet.

How this can be done is an easy yet complex task. Networking and building social groups is one way of getting the people of choice on board. Business associations help get you known to a wide variety of people with their vivid ideas and styles of working. It is a platter for one to select from.

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Ed-tech In India: Searching for Scale

By Vinay Sharma

Ed-tech world in India is buzzing with activity these days. Budding edupreneurs backed by angel and VC funding are enthusiastically working on creating the next level of learning solutions trying to solve the complex puzzle of learning. Education needs technology to solve some large problems of access, quality and distribution.

Being an active part of this eco-system, and having done investments and collaborations with companies in this sector, one has the opportunity of interacting with a multitude of new start-ups, understanding their objectives, evaluating their offerings and business models. This has been across various sub segments like K 12, test prep, HE, ancillary services, and game based learning, AI etc.

Though it's interesting and impressive to see the new ideas and approaches which are being taken to leverage technology for delivering better education, most of these companies face a common challenge: How to build a scalable and sustainable business? In fact, this is the acid test which investors are trying to assess, and entrepreneurs struggling to find answers to. Various factors are leading to this, like

1. **Customer Response:** Just like other industries, entrepreneurs in education are building business models keeping the product/service, TG, size of market and expected traction in mind. They are also encouraged by the fact that Indians spend a lot on education. However, there is a difference between formal and value-add education (primary

domain of Ed-tech). While parents/students spend a lot on paying institution fees and tuition fees, same is not true for any additional service until they are clear on the outcomes from the same. So, response of consumers in both cases are very different

2. **Focus:** Most of the Ed-tech companies have people who have strong capabilities in business and technology. Hence, they have been able to conceptualise and create innovative and high-tech solutions for Education. However, enough thought hasn't gone on customer understanding - the current education system, its operations and challenges, pain areas, perceptions and perspectives of the various stakeholders of the system. Actually, this is the difficult part of going and working together with institutions/teachers/students who are sometimes skeptical of new solutions. Not many companies have been able to do that.

3. **Impact:** Until and unless, the solution improves the efficiency or efficacy of education delivery or makes life easier for institute, teacher or student, it's difficult to build huge traction around the same. In education, this is a difficult and time consuming process. It's difficult to get entry into an institution and get an opportunity to test pilot your solution. Even if that is done, it takes a couple of education cycles for any solution to demonstrate the real impact. There are too many people trying to solve one issue or more with their offering. It's nearly impossible for any institution or user to try/use so many offerings.

4. **Channel:** This is particularly true in K 12. While student is the final consumer, he/she has a little role in evaluating and deciding. Current system of schooling and education is already running with conventional means, and is quite slow to adopt new practices. Moreover, the incentive to put efforts and resources to experiment is not very high. Though there are innovative institutions, and ideas are being implemented but their scale is quite low as compared to the total universe

5. **Long term commitment:** Education is a very fragmented industry with a large number of small players contributing towards the eco-system. For Ed-tech solutions to become main stream, large players and investments are needed to create the necessary awareness and education for consumers to adopt new solutions. This needs significant money and time. Any amount of marketing can't shortcut the process of credibility building which will happen only after at least a couple of successful education cycles. This needs a lot of patience along with deep pockets.
6. **Infrastructure:** The basic infrastructure whether its internet, ICT, IT savvy teachers, devices to consume digital content, language of content (not all can read English) are still challenges, in many parts of our country. For example, I am not sure out of more than a crore of people who give Govt services/Bank PO exams , how many have access to right device/Internet to practice for online exams, even if they want to.

So, it's now incumbent upon the Ed-tech players to understand these challenges, and convert some of these into opportunities to build their businesses. Well, there are no easy answers for these issues. However, there are a few pointers which can help one navigate these.

1. Understand the genuineness and criticality of the education problem that you are trying to solve. This will determine whether your offering can become a 'must have' vs a 'good to have'. Many companies get trapped in the novelty of the solution rather than its actual impact on learning.
2. Be ready for the long haul. However innovative or path breaking the solution may be, it will take a minimum amount of time and usage for you to prove its efficacy on the ground.
3. It's difficult to get opportunity/entry to test new offering with sufficient number of institutions/users. However, there is no shortcut for that.

Involving users right from beginning and being able to show them real value is a very important but difficult task. Focus on users as much if not more than technology.

4. Create a large impact. There is no point in solving one out of 10 parts of problem. No institution or users has the time and ability to use multiple solutions. It's better to join hands if necessary, and become part of a single larger solution. Alliances/tie ups can help here.
5. Also look at putting disproportionately high effort and energy on facilitating customers/influencers. Onus of customer getting value from your offering is on you not the customer.
6. Story telling is also missing here. People get entangled in complex solutions and features instead of outlining the clear benefits in a simple and succinct way to users.

Although difficult yet there is no better time than today to build a meaningful and sustainable Ed-tech business. Worldwide, one has begun to see such examples. Many companies have started showing traction and are on way to build scale. Growing internet, mobile penetration and sheer scale of experimentation and efforts will further fuel this. Two things looks certain: one, there will be a lot of churn leading to many companies going down. Second, it will also throw out some clear winners who have stuck to fundamentals, and have built on the long term trends instead of becoming prisoners of short term fads. Nonetheless, we are in for some interesting times ahead.

Author:
Vinay Sharma is Business Head – Digital & Services, S. Chand Group
Twitter: @vinay73

Views are personal and do not represent those of CII, DST or AICTE or their staff

Equal Partnerships? No.

By Ashish Jain

When starting a business, founders tend to divide ownership equally among the partners. Many start-ups are incepted with founders knowing each other. When friends join together, they are equal and hence they must get equal share in the venture they are starting with. If the partners are not contributing equally, is it desirable?

Let me share a case example. Ankit, Joseph and Dimple were in the same college. Ankit is one year senior to the other two and is also the harbinger of starting this venture. He knew Joseph, for his technology passion and Dimple for her outgoing public speaking and reach-out skills. Ankit, quite convinced with his idea, shares it and asks them to join him. Joseph has issues with non-supporting family to his start-up idea and Dimple can't relocate to the city the venture is starting in. Still, Ankit is left with these two, as he has approached many others in the past three months, with a promise of they joining him but never did. Ankit settled for this option. They agree that Joseph and Dimple will be in full time job and support the venture by contributing Rs 20,000 each month, besides shouldering some responsibilities relating to their area of passion, for an equal share in the venture. Dimple plans to join Ankit, full time in a year's time.

The understanding is innovative as is expected from a startup founder. But there are two problems in this arrangement. One, Ankit is left alone

to manage the affairs of the enterprise with very selective and specific role shouldered by others. That makes his team a no-go before any investor. Second, the venture needed about Rs 20 Lakhs over two years, 50% of which Ankit will need to invest from his side. Ankit is full time. Joseph and Dimple are not. Major risk is borne by Ankit.

If we analyze further, simplistically, let's take only two key parameters into consideration – role and investment.

There are roles of CEO, CFO, CTO, CMO and CHR to say the least in any venture. In the above case example, CEO and CFO roles are with Ankit, CTO with Joseph and CMO/CHR with Dimple. If not in full time engagement, would Joseph and Dimple be able to perform their CTO and CMO roles completely or any spill over will need to be managed by Ankit himself or through outsourced help? Joseph being at Mckinsey argues that his technical prowess and work environment will help him come up with better technical solutions faster, to make up for his less time involvement.

The investment share of three is in 50%, 25%, 25% composition. It is also unequal.

In such a scenario, should the share of three in the venture be equal? I feel no.

What is likely to be fallout from such an arrangement? Is it not an innovative method of win-win-win situation created by the founders of this venture?

The venture soon will see the frustration of not only Ankit, but also of other two. Most likely decisions will be taken by Ankit, sometimes not in consultation, as generally is demanded of the situation in any small

organization. Also, Ankit's un-intentional encroachment on CTO or CMO roles, as necessitated, may not find approval from Joseph and Dimple. Soon, based on human psychology, every chance is for Ankit to feel cheated and frustrated for doing ALL the work, while others are not contributing enough, but is equal partner.

The solution thus is to make unequal partnership based on these two factors – role and investment. Give weightage of 70% to the role and 30% to the investment. This is also the way to indicate defined leadership with adequate authority to make final decision and sufficient compensation to remain motivated. In the scheme of things, only distribute 90%, keeping about 10% of the share reserved for ESOPs that will come handy to attract key talent later. Considering each of Joseph and Dimple are able to contribute about 75% to their role in this fashion and kind of investment mentioned, the share of partnership should be 38%, 26%, 26% amongst Ankit, Joseph and Dimple respectively. When Dimple joins full time after a year, this percentage should change to 35%, 26% and 29%. Whatever is the share, keep a period of vesting from 3 to 4 years at least.

It is equally important to note what happens in the real life. Circumstances change and partners do quit. In the identified situation, some partners due to their peripheral involvement have low risk to quit the venture and thus have more likelihood. It is pertinent to design the smooth exit safeguarding the interest of all involved. As revenue results and valuations may not be available (quit decision less likely if they are available and sound) by the time quit decision comes from any of the three, it is prudent to provision for about double the market rate returns (of 10%) on the invested amount in the year 1 and triple the returns in the year 2.

The given solution is indicative and variations in situation may impact a change in the share, keeping approach the same.

I support the arguments of un-equal share in partnerships even if all the co-founders are on-board full time. Differentiate by small percentage, based on the amount of investment, but the governance structure must be clearly defined in case of disagreements. All significant decisions must be made on consensus, transparency kept fully else partnership will break sooner than one thinks. However, clearly defined conflict resolution goes a long way in smooth running of the enterprise and bringing in order.

Author:
Ashish Jain is Chief Evangelist and mentors founders of start-ups on strategy
www.thestartupboard.com

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Confederation of Indian Industry

Department of Science and Technology
Government of India

All India Council for Technical Education

Young Indians
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Sujit Banerjee
Director/ Scientist – F, National Council for Science & Technology Communication,
Department of Science & Technology
Government of India

B Prasada Rao
Formerly Chairman & Managing Director
Bharat Heavy Electricals Ltd. (BHEL)

Vibha Dhawan

Distinguished Fellow and Senior Director, New Initiatives and Programmes
The Energy Resources Institute (TERI)

Dr Vibha Dhawan is associated with The Energy and Resources and Institute for over 30 years. At present she is Distinguished Fellow and Senior Director (New Initiatives and Programmes). She has also completed one term as Vice-Chancellor, TERI University. She has recently completed an assignment with Borlaug Institute for South Asia.

Dr Dhawan as a researcher was instrumental in establishment of Micropropagation Technology Park at TERI. Her recent research in the field of production of clean fuel through biotechnological approaches.

Dr Dhawan is actively involved in policy development both at the national and state level. She is task force member of number of committees of the DBT, BCIL, BIRAC, etc.

She was an Advisor, Bio-resources & Biotechnology to the Chief Minister of Assam. She is also serving as Adjunct Professor & Consul General South Asia Partnership, at Michigan State University.

Kumaar Bagrodia
Founder & CEO
LeapVault, India and
National Chair – Innovation & Entrepreneurship
Young Indians

Kumaar is the Founder & CEO of LeapVault, a premier knowledge media and executive development company.

He is an executive & entrepreneur Coach, India Strategy & Change Consultant and is also an investor in Knowledge & Media platforms. Kumaar has several years of cross functional expertise across industries and domains. He has earlier worked with companies like Infosys and WNS where he was an associate director globally. He has consistently been rated very highly by customers across the globe which includes leading global investment banks, consulting firms, financial research houses and Fortune 100 corporates.

Kumaar holds an MBA degree from the University of Oxford, is a Country Champion and Ambassador for the Oxford Business Alumni in India. He has been featured in various media in India and abroad including Wall Street Journal, knowledge @Wharton, The Economic Times, Hindustan Times, Bloomberg TV and Forbes to name a few.

He is the founder of India's most prestigious platform for organizational learning & development, training, coaching: CLO Chief Learning Officers Summit India since 2009. He is also Founder of Asia's largest platform for non-fiction books and writing, India Non Fiction Festival since 2013 and Founder of world's largest online literary festival platform, LitFestx in 2015.

Ashish Jain

Chief Evangelist
The Startup Board

Ashish is Vice President in India for France HQ Steria and undertakes business development from European geography to India. Additionally, he also heads India Domestic system integration business with its P&L. Earlier he has successfully led offshore business development from Benelux region (central Europe). In 2014 and 2015, he championed the cause of innovation at Steria India and brought changes in IT delivery and digital transformation. Ashish has experience of setting up a GIC. Way back, Ashish founded a start-up with niche products in Travel and Media and successfully established leadership position in each product segment. He is an IIM-Calcutta alumnus.

Knowledge of cultural diversity from US, Continental Europe, UK and Indian IT market, has helped Ashish deliver successfully to his customers. He has led specific hunting and mining initiatives successfully from the geographies worked upon. Coming from technical background, helped him in effective solution selling. He possesses excellent articulation skills for executing practical go-to-market business plans. He is result oriented professional with people sensitivity skills.

Ashish, with over 20 plus years of experience in IT and Education industry, has been visiting faculty at leading corporates and educational institutes across India. He is accredited leader certified by Penna, UK.

He stands apart on his business acumen and mentors entrepreneurs in start-up strategy, helps in troubleshooting execution and facilitates in validation of business plans. Ashish is avid reader and writes blogs and articles that are published on his blog, in financial journal and newspapers.

Ashish has done executive MBA from Indian Institute of Management, Calcutta (IIM-C) with focus on strategy and finance. Earlier, he completed B. Sc (H) Maths from Hans Raj Collage, Delhi University.

Nikolai Dobberstein
Partner
A T Kearney

M B Chetti
Assistant Director General (HRD),
Education Division
Indian Council of Agricultural Research, New Delhi

Education

College of Agriculture, Dharwad, UAS, Bangalore: B.Sc. (Agri) 1978; M.Sc. (Agri) 1981; , IARI, New Delhi-Ph.D. (1981); Post Doctoral Fellow, University of California, Los Angles, 1985-87; Certificate of Training, McGill University, Canada, 2004-05

Positions held

Asst. Director General (HRD), ICAR, New Delhi, 2015: Director of Extension, UAS Dharwad, 2013-15; Director of Education, 2013; Dean (Agri.), College of Agriculture, UAS, Dharwad, 2008-13; Director of Students Welfare, 2008-09; University Librarian (Addl. charge) 2006-07; Registrar 2006-07; University Head (Crop Physiology) 1996-2008; Professor, 1991-96; Associate Professor,

1989-1991; Development Officer, 1985-89; Post Doctoral Fellow, University of California, Los Angeles 19985-87; Post Doctoral Fellow, IARI, New Delhi 1985; Instructor, 1981;

Awards and Fellowships:

BASF Crop Protection Asia Pacific Award "Top Ciencia" Forum of BASF, The Chemical Company, 2011, 2012,

2013; Best Poster Award, 1994; Bharata Ratna Dr.C.Subramaniam Award for Outstanding Teachers, 2001; Sir C.V. Raman Award for Young Scientists 2001; J.J.Chinoy Memorial Gold Medal 2001; Fellow, Indian Society for Plant Physiology, New Delhi, 2003; Academy for the Advancement of Agricultural Sciences Senior Award, 1998; Air India Broader Outlook Learner-Teacher (BOLT) Award, 2004; Rajiv Gandhi Excellence Award, 2007; Dr. K.K. Nanda Memorial Lecture Award-2011 of Indian Society for Plant Physiology, New Delhi, 2011; Best Article of the year, 1996; Gold Medal for General Merit, University of Agricultural Sciences, Bangalore for M.Sc. (Agri.), 1981; College of Agriculture, Silver Jubilee Gold Medal for M.Sc. (Agri.), 1981; Karnataka State Award for M.Sc. (Agri.), 1981

Roles & responsibilities of the current position:

As Assistant Director general (HRD), responsible for improving quality of higher agricultural education at national level through All-India Admissions in UG/PG/ Ph.D., Award and distribution of fellowships, Admission of foreign students, Capacity building of faculty through Summer-winter schools and Centre of Advanced Faculty Training, recognize outstanding scientists by award of National Professorial Chairs and National Fellowships, Emeritus Scientists and technical support to National Academy of Agriculture Research Management. Interacting with the Vice Chancellors, Deans, Directors, National Professors and other Scientists at National level to pursue an agenda based issues.

Research Area

Photosynthesis and crop productivity, Hormonal and Chemical Regulation of Plant Growth, Post Harvest physiology and value addition, Pesticide residue and quality analysis, Education Management, Education Technology and Human Resource Management.

B B Ahuja (Prof)

Director

College of Engineering, Pune and

Professor at Department Production Engineering & Industrial Management

Prof. B. B. Ahuja is a graduate in Mechanical Engineering with a post-graduate degree in Mechanical Engineering. For his doctorate, he did his research in the area of Hybrid Bearing Design for High Speed Spindles at College of Engineering, Pune (COEP). He also holds a Masters degree in Management Science.

He has to his credit over 117 technical published papers in National & International Journals and Conferences. His research papers have been widely cited, in technical papers and reference books. He has guided 19 Doctoral students, 85 postgraduate students and is credited with the establishment of CAD/CAM laboratory and indigenously developed FMS laboratory in the institute He is currently developing the 3D Printing lab and is a working on a major project in Biomedical Engineering for developing Low cost medical devices / implants which is sponsored by Rajiv Gandhi Science & Technology Commission Govt. of Maharashtra. He has worked on two major projects of DST and CSIR. His research has led to 9 patents being registered to his credit.

He was appointed as a Chairman, Board of Apprenticeship Training (BOAT) Western Region by Ministry of Human Resources Development for a period of three terms consecutively since 2007 and also a Chairman, All India Board of Vocational Education, AICTE, New Delhi from 2009-2013. He is a member of the Governing Council of AICTE, New Delhi. He was appointed as a Chairman of All India Board of Technician Education, AICTE New Delhi and a member of Governing Council of AICTE, New Delhi. Currently he is the Chairman of All India Board of Vocational Education, AICTE New Delhi. He is also a member of Executive Committee of National Board of Accreditation, New Delhi.

For his zeal and commitment recognizing his excellent teaching skills he was honoured with Best Teacher Award by Government of Maharashtra in the year 2009-10, "Aadarsha Gurujan Jeevan Gaurav Puraskar" for the year 2015 by MIT, Pune and "Excellence in Education Award" for the year 2011-12 from PSD Shastri Educational Foundations Shastri Group of Institutions in recognition of outstanding contribution towards Engineering Education. He has received The Institution of Engineers (India) Gold Medal for the best research paper published during the year 1998-1999 and also The Production Engineering Division Prize for the best paper published during the year 2003-04, 2008-09 and 2009-10 again by The Institution of Engineers, India.

He is actively associated with various governmental agencies in Pune for R&D activities in Manufacturing Engineering and is also a consultant to a few Industries in Pune. He is a Fellow of the Institution of Engineers (India) and the Indian Institution of Production Engineers. He is a member of, Computer Society of India, Operations Research Society of India and the Association of Mechanisms, Robotics Society of India and Machines Indian Society for Technical Education. He is also a Member of the Romanian Society of Mechanical Engineers of Romania.

Digvijay Singh
Vice President
Indian Angel Network

Digvijay is a professional with over 15 years of sales experience in leading companies across sectors. He has continuously built sales / distribution model from scratch in virgin territory and scaled it to national levels.

Starting with offline product company, Apollo Tyres, he built from scratch the company's distribution organisation in Uttaranchal which was driven by dealer network. He built this in an entrepreneurial model and which has now become well entrenched in the state. He also opened up new accounts in the government sectors like UPSRTC (Uttar Pradesh State Roadways Transport Corporation) to become a fast tracker with the company.

From tyres to Insurance, Digvijay helped build the Distribution Network of ICICI Lombard GIC Ltd. The distribution network included direct, agency and dealer distribution models. Again, he led from the front & built the team which took this distribution network national. Digvijay evolved with the digital environment and led the retail network of brokers in the NCR area for Magic Bricks.com. He was quickly awarded the Best Zonal Business Head for Q1 of 2014-15 as the conversions continued to increase. This quickly brought him the opportunity of a national role to lead a 200 person feet on the street model with a management team of 15. This was a challenging role as it combined both user acquisition, conversion to sales, with sourcing and then providing quality data of brokers to the team. 1 Yr. in managing a PAN India team for 15 managers and 200 Fleet on street, in for sourcing primary data as well as curating it for efficient use by the company.

With the startup ecosystem growing, Digvijay decided to swivel his career by opting to join Indian Angel Network (www.indianangelnetwork.com) as Vice President moving himself from a corporate executive to player in the entrepreneurial world. IAN is India's first and the world's largest angel investor group with over 400 investors from 10 countries, over 100 company portfolio and growing spread across 7 countries and 17 sectors. It has been labelled as the Top Funder in India and providing perhaps the highest returns to seed / early stage investors. Digvijay leads deal origination nationally as well as drives the operations of the organisation across multiple functions. Digvijay is a Post graduate and is a hands on business builder

Tanikella Chandrasekhar

Scientist-E

Technology Information, Forecasting & Assessment Council (TIFAC)

Tanikella Chandrasekhar is Scientist-E at Technology Information Forecasting & Assessment Council TIFAC), an autonomous institution under Department of Science & Technology (DST), Govt. of India, New Delhi.

Chandrasekhar Completed his M.Tech.(Biotechnology) from Jawaharlal Nehru Technological University (JNTU), Hyderabad in 1994 and his B.E. (Chemical Engineering) from Shivaji University Kolhapur in 1991.

He has an experience of more than 20 years in the areas Food Processing, Biotechnology & Bio-processing, Industrial and Environmental Bio-technologies with Specializations in : Technology Intelligence, Forecasting, Assessment & Management; Strategic Planning & Management; Programme Development; Project Management including IPR Management.

During 1995-1998, under the guidance and in close interactions with the Late Dr.A.P.J. Abdul Kalam, the then Chairman TIFAC, he coordinated Nation's 1st long term national technology forecasting exercise "Technology Vision for India upto 2020" and follow-up actions. More popular as "Vision 2020".

During 1998-2011, he co-ordinated realization & implementation of Six "Technology Vision 2020 Mission Mode Projects". He monitored many projects & interventions in wide technology areas including Agro Food Processing, Life Sciences & Biotechnology, and Environmental Engineering sectors.

During 2011-2014, he headed Patent Facilitating Centre (PFC) which supports protecting Patents & IP emanating from Indian Academics & National R&D Institutes free of cost and trains women scientists in IPR related areas. During his tenure, he initiated many new activities and programmes at PFC.

Currently his efforts are towards National Studies on Value Additions in Biotech Clusters, Secondary Agri Bioproducts and Non Timber Forest Agricultural Minor Forest Produce. He also participated in various Foreign Assignments Presenting TIFAC's experience in Technology Forecasting at China, Hong Kong, South Africa, USA, UK, Turkey.

Paramjit Singh Sahai
MD
EPA Infrastructure Pvt Ltd

A Civil Engineer from IIT Delhi, 1977 Batch, Paramjit started his career with Engineers India Ltd where he worked on Turnkey Multidisciplinary Project in the Design, Tendering and Construction Departments.

He headed the Civil Department of Shriram Projects and worked on various Chemical Process Plants for turnkey design and execution. Some years later, he Joined Era Constructions India Ltd and founded WTD Era India Ltd as a JV between WTD Srl, Italy and Era Constructions India Ltd. The focus was on Turnkey projects in Water and Waste Water treatment plants.

Joined GS Developers & Contractors Pvt Ltd as Director, where he was responsible for Marketing and Execution.

Pramjit began his entrepreneurial journey in April 2003 with setting up a modest Speciality Construction Services Co.Have recently started another venture in Real Estate for promoting Development of Affordable Homes for the Masses on a Pan-India Scale.

Pankaj Thakar

Serial Entrepreneur. Coach. Mentor
Angel Investor and
Advisor to Start-ups & Digital Media Evangelist

Pankaj Thakar is a Serial Entrepreneur with 30+ years of Corporate and Start-up Experience. In his Various C-level role and founder of multiple start-ups globally, he has built, advised and transformed, both corporate and start-up companies to become highly successful.

Over the last decade Pankaj has specialized in Digital Media Strategies, Digital Marketing, Online Consumer Behavior and Big Data Applications & Analytics. He has attended Harvard Business School Executive Education programs in Digital Media, Digital Marketing, Big Data Analysis & Applications, to validate his understanding & fine-tune his skills.

He is a prolific speaker & has spoken in many conferences and seminars, in India and abroad. He also enjoys writing and has written many case studies/white papers in Traditional as well as Digital Marketing & recently on “Change Management” while helping a company to “transform” & stay relevant. Pankaj enjoys mentoring, coaching and advising Start-ups at various stages from idea to growth & currently is engaged with many of them. Hence his next Move – PadUp Ventures - a Mentor Driven Incubation Program that helps these technology startups start, survive, sustain and scale.

Vinod Sood

Managing Director

Hughes Systique Corporation (HSC)

Vinod Sood is currently Managing Director at Hughes Systique Corporation (HSC); an Engineering R&D services company. Prior to his current role, he was Head of Global Engineering and R&D at Hughes Software Systems (HSS) and served on its Board as well. Before HSS, Vinod worked with C-DOT where he was part of the core team which designed India 1st Digital Switch. Vinod is a veteran of hi-tech software industry, during his career span of 30 years he has built high performance teams at premier R&D organizations in India. Vinod has an exceptional track record of building profitable and sustainable institutions from conceptualization to maturity.

He is member of NASSCOM and AMCHAM's Northern Regional Council. He is also on the NASSCOM Mentor Panel for Emerging Companies. He is a member of Advisory Committee of the Institute of Informatics and Communications, University of Delhi. Vinod is involved in guiding and mentoring young entrepreneurs and startups and is on the Advisory Boards of some of these startups most notably OYO rooms. He is a TiE Charter member and is part of several juries to identify emerging startups and product companies. Vinod is alumnus of PEC Chandigarh from where he graduated with a Gold Medal.

Jitender Minhas (Colonel)
CEO
JSSATE-STEP and
Consultant the Government of
Swaziland (Southern Africa)

Colonel Jitender Minhas is an alumnus of National Defence Academy and the Indian Military Academy from where he graduated to be commissioned into the Indian Army as an Officer in the year 1990. After serving in the Army for 22 years in the Corps of Signals, he took premature retirement in the year 2013 in the rank of Colonel. During his military stint, he held various coveted appointments including that of a Commanding Officer of an elite Telecom unit. He also did a deputation to a foreign country as a trainer of the Army personnel of that country.

After the premature retirement from the Army, he pursued a full time MBA program from Indian School of Business, Hyderabad, where he was introduced to the finer aspects of Business management and entrepreneurship. Post his MBA he carried out few consulting projects with large IT companies in UK and US. He later joined JSSATE-STEP as its Chief Executive Officer and has been mentoring start-ups ever since.

He has been instrumental in setting up entrepreneurial eco-system in Mcleodgunj for the Government of Tibet (in exile). He is presently providing consulting services to the Government of Swaziland (Southern Africa) for setting up an incubator in the country and development of entrepreneurial eco-system.

Arun K Pathak

Director & Co-Founder
Free Spirit Retail Pvt Ltd

Arun is co-founder of 'Free Spirit Retail Pvt Ltd', an e-com venture in Indian Handicrafts, Home Furnishings & Ethnic wear segment with PAN India presence

Arun has two decades of extensive global & corporate leadership experience. He is a mentor, consultant & visiting speaker to institutions & start-ups on Business plan, Strategy, IT future trends.

He has successfully managed and delivered multitude of business critical & complex programmes across various domains & technologies in software development. He has a track record in managing customer relationship, end-to-end SDLC life-cycle, organization process improvements & change management, vendor management.

Arun has been visiting speaker to institutions on emerging trends and areas in IT & programme management and is an active speaker and participant at PMI North India Chapter.

He has successfully led a multitude of business critical & complex IT programmes across various domains and has worked with Amdocs, Xansa & TCS.

He completed the 'Leadership & General Management' program from INSEAD France / Singapore and is an alumnus of premier academic institutions, IIT Kharagpur and IIT Roorkee.

Abhinav Banthia

Director

Manu Yantralaya Pvt. Ltd and

Past Chair-Jaipur Chapter of Young Indians

Born on 13th Sep 1981 in Jaipur, Abhinav belongs to Jain family which started their business in 1988

After completing his schooling from St. Xavier's, Jaipur, he went away to Bangalore to pursue Mechanical Engineering from R.V.C.E College of Engineering.

Once armed with the engineering degree, he went to Japan for three months in order to gain the know - how of manufacturing of Ball Bearing components.

In 2003 Abhinav joined his family owned company Manu Yantralaya Pvt. Ltd. Which primarily supplies bearing and automotive components with around 30% of exports to Europe, China Argentina, and Indonesia etc. There are four manufacturing plants under this company.

In 2012 he formed a Japanese joint venture company and later diversified into plastic components for automotive industry.

They are the only Indian company in bearing industry who won 'Global Best Suppliers Award' for Quality and Delivery from the Global Bearing Giant SKF. They have also been a 'Zero Dimensional Defect Supplier' to all their customers for last 15 years. In 2009 they had been awarded with 'National Entrepreneurship Award' from MSME Ministry.

They have been recipients of Rajeev Gandhi National Award for Quality by Bureau of Indian standard in 2010 and 2013.

Abhinav has been the Chair-Jaipur Chapter of Young Indians (Youth body of CII) and Board member of Quality Circle of India –Jaipur. He currently is member of CII. He loves to travel and play the guitar.

MP Poonia (Dr.)

Director

National Institute of Technical Teachers' Training & Research (NITTTR)

Educational qualifications:

- M.Tech (Mech), IIT, Delhi
- Ph.D (Thermal Engg) IIT, Delhi
- Member of IEI, ISTE & Society of Automotive Engineers

Experience

- 30 years experience

Professional and Administrative experience

- As a Faculty at Engineering College, Kota, Rajasthan (from 1986 to 1999 = 13 years)
- As a Faculty at Malaviya National Institute of Technology (MNIT), Jaipur (from 1999 to 2004 = 5 Years)
- As a Principal, Government Engineering College, Bikaner (Rajasthan) (from 2004 to 2010 = 6 Years)
- As Dean (Planning and Development) at Malaviya National Institute of Technology (MNIT), Jaipur (from 2010 to 2012 = 2 Years)
- As Director of National Institute of Technical Teachers' Training and Research, Chandigarh (from 2012 till date = 3 Yrs)

Publications

- Guided research at Master's and Doctoral level
- Published/Presented more than 80 papers in National and International Journals
- Published several books and manuals in the field of Mechanical Engg.

Research Projects

- Undertaken projects sponsored by AICTE, DST, Delhi and Govt. of Rajasthan and MHRD.

Ares of specialization

- IC Engines, Gas Dynamics, Ref & AC, Renewable Energy, Sustainable Development

Countries visited

- Australia, USA, China, Thailand, Singapore & Sri Lanka

Awards received

- Honoured on 15th August, 2008 by the District Administration, for extraordinary and meritorious services as Principal, Govt. Engg. College, Bikaner during 2005-07
- "Eminent Engineering Personality Award – 2012" on Engineers Day by Institution of Engineers, Haryana Chapter at Geeta Institute of Management & Technology, Kanipla, Kurukshetra.
- National Award for the Empowerment of Persons with Disabilities – 2013 by the Hon'ble President of India on 3rd December, 2013 in New Delhi in recognition of outstanding performance in the field of Best Institution for Empowerment of Persons with Disabilities in the country.
- Bharat Mata Award conferred by Indian Institute of Oriental Heritage (an International Institute of Oriental Studies and Research, Kolkata) on 16th August, 2014 during its 37th National Seminar and Convocation Ceremony
- 2nd Rajbhasha Award conferred by Govt. of India, MHRD, Hindi Rajbhasha on 14-15 May, 2015 in SVNIT, Surat

Membership

1. Chairman, Distance Education Council of Punjab Technical University, Jalandhar
2. Member of Senate, Thapar University, Patiala
3. Member of Board of Governors, Thapar University, Patiala
4. Member, Managing Committee of Thapar Polytechnic College, Patiala
5. Member, All India Council of Technical Education (NWRO Chandigarh)
6. Member, Governing Body of NC College of Engg. & Technology, Israna (Panipat)
7. Member, Research Board, Punjab University, Chandigarh
8. Member, Pushpa Gujral Science City, Jalandhar
9. Member, State Steering Committee under Technical Education Quality Improvement Programme (TEQIP) of Haryana State
10. Member, "Board of Studies" on Mehr Chand Polytechnic College, Jalandhar for looking after the affairs of the Community College.
11. Member, All India Board of Technician Education
12. Member, Academic Council of Deenbandhu Chhotu Ram University of Science and Technology, Sonepat (Haryana)

13. Member, Task Force, EBAC (United Nations Economic and Social Commission for Asia and the Pacific ESCAP Business Advisory Council) for Promoting Socially Responsible Business
14. Member, Board of Studies (BOS) constituted for Community College, YMCA University of Science and Technology, Faridabad (Haryana).
15. Chairman of a Committee constituted by Govt. of Haryana for checking the validity of Degrees/Diplomas acquired by Technical Education through Distance Mode
16. Member, Engineering Evaluation and Accreditation Committee (EEAC) for Tier-II constituted by National Board of Accreditation, New Delhi
17. UGC Representative on the Board of Governors of Manikya Lal Verma Govt. Textile and Engineering College, Bhilwara (Rajasthan)
18. Member of Governing Board of Desh Bhagat University, Mandi Gobindgarh (Punjab) as a special invitee
19. Member, Board of Governors of IK Gujral Punjab Technical University, Jalandhar
20. Member, Sub-Group of Chief Ministers on Skill Development set up by NITI Aayog
21. Member, UGC Governing Council, Western Regional Instrumentation Centre (WRIC), Mumbai
22. Member of Governing Council of Haryana State Board of Technical Education, Panchkula
23. UGC Nominee member on Board of Management of Yeshwantrao Chavan College of Engg., Nagpur
24. UGC nominee on the Committee for the appointment of Vice Chancellor, Gujarat Technological University, Gandhinagar
25. UGC Nominee Member on Governing Body of Guru Nanak Institutions Technical Campus, Manchal Mandal, Hyderabad
26. UGC Nominee in the Planning & Monitoring Board of BS Abdur Rahman Institute of Science & Technology, Vandalur, Chennai.
27. UGC Nominee on the Governing Board, INFLIBNET Centre, Gandhinagar
28. UGC Nominee on the Governing Body of Karpagam College of Engg., Mylleripalayam (village), Othakkalmandapam, Coimbatore – 641 032

International Membership

- Advisor of the Sustainable Business Network of ESCAP Business Advisory Council

Dinesh Mohan

Professor School of Environmental Sciences,
Jawaharlal Nehru University, Delhi

Prof. Dinesh Mohan has more than 21 years of diverse research experience aimed at the challenging problems in the area of Energy and Environment. A key theme throughout Prof. Mohan's career has been the merger of basic academic science research with the development of applications to industrial processes. The merger of basic science with engineering follows from his research pathway.

Professor Dinesh Mohan conducts research on water (ground and surface) and wastewater monitoring and development of sustainable treatment technologies, use of thermochemical platform for the production of biofuels (biooil) from lignocellulosic biomass. Prof. Mohan is also involved in biochar development, characterization and utilization in water filtration, soil immobilization and fertility, carbon sequestration and climate change mitigation. Laboratory and field studies to evaluate the effects of biochar on crop yield, nutrient retention, nitrogen cycles, nitrous oxide and methane dynamics, water holding capacity and carbon cycling are in progress/ completed. Prof. Mohan has developed a variety of activated carbons/ magnetic carbons/nanosprbents/biochars for the remediation of organic (phenols, dyes, pharmaceuticals, pesticides etc.) and inorganic (heavy metal ions, fluoride, nitrate etc.) pollutants from water and wastewater.

Professor Mohan is also interested in the transfer of basic research to the private sectors/industries/ organizations/NGOs for commercial development to aid the poor peoples who cannot afford the sophisticated costly water treatment methods. This can range from applied to fundamental basic research.

Satyabrata Jit

Head, Department of Electronics Engineering,
IIT (BHU), Varanasi

Prof. S. Jit has earned his B.E., M.Tech. and Ph.D. degrees from the University of Calcutta, IIT Kanpur and IIT(BHU) in 1993, 1995 and 2002 respectively. He has supervised 12 Ph.D. theses and more 30 master's theses; has published more than 150 research articles; and has authored/ coauthored/edited 04 books. Prof. Jit is the recipient of the INSA Visiting Fellowship in 2006; Postdoctoral Research Fellowship from the Georgia State University, USA in 2007 and; the BOYSCAST Fellowship of the DST, Govt. of India. He has served as the Coordinator/Director, Computer Center, BHU, Varanasi from February 2012 to March 2014. Prof. Jit is a member of the BoG, HBTI Kanpur and UPTTI, Kanpur. Currently, he is the Head, Department of Electronics Engineering, IIT(BHU), Varanasi. He is also the Chief-Investigator, SMDP C2SD project of the DeitY, Govt. of India. He is the Fellow of IETE (India) and IE (India); and Senior Member, IEEE (USA).

Ashok Biradar

Executive MBA Candidate

Indian Institute of Management, Ahmedabad

Ashok Biradar got his Bachelor's degree in Mechanical Engineering from Mumbai University. Post this he attended IIT Delhi where he was awarded the MTech degree in Design of Mechanical Equipment in 2005. After graduation he joined the Research and Development division of Tata Motors Limited (one of the leading automobile manufacturers in India) in the role of a Mechanical Design Engineer. For the past ten years, Ashok was involved in the design of automotive transmissions for a variety of vehicles such as Pick-ups, Passenger cars and Defense vehicles. Currently Ashok is pursuing a one-year full time MBA from IIM Ahmedabad.

Sarvesh Prasad

Executive MBA Candidate

Indian Institute of Management, Ahmedabad

Sarvesh is an ex-Naval Fighter Pilot with 13 years of experience in cross functional roles in the Military. He has worked in a variety of functions ranging from Training and Operations to Procurements. In his career in the Navy, Sarvesh has flown a wide variety if fighter jets including the MiG 21 and the Sea Harrier. His interests span across Strategy, Digital Marketing, and E-commerce.

Presently perusing PGPX at IIMA, Sarvesh and his wife Deepika Srivastava are co-founders of E-commerce startup www.deesalley.com. His firm deals in a variety of handloom products and was recently selected by Ministry of Textiles, Government of India as an E-commerce partner for selling Handloom products online.

Priyank Garg

Joint - Managing Director

Advance Valves Pvt Ltd.

Confederation of Indian Industry

Department of Science and Technology
Government of India

All India Council for Technical Education

Young Indians
WE CAN WE WILL

India Innovation Initiative

Opportunity to harness innovations for wealth generation and societal benefit

8TH INDIA INNOVATION INITIATIVE 2016

Project Synopsis

Institutional Partners

Knowledge Partner

List of Projects

Innovation ID	KarmajoMrs1619
Innovation Title	**Innovative and cost effective approach of recovering Silk protein Sericin from industrial effluent and unreelable silk waste of Silk reeling industry for various potential application**
Focus Area	Bio Tech
Innovators	Mrs Smrita Pradhan, Dr. Mousumi Mondal, Srinivas BV, Gaurav Bhardwaj

India is the 2nd largest producer of mulberry silk. The annual production of silk was up to 28708 MT, 2014-2015. Karnataka is the leading producer of silk where Mysore, Ramanagaram and Chikballapur are the major Silk reeling hub. Sidlaghatta taluk in Chickballapur itself has around 3000 reeling industries. Silk cocoon are made of two protein, fibroin (70%) and sericin (30%). In reeling industry, fibroin are separated from sericin by process called degumming/cocoon cooking where the fibroin are used for making commercial silk fabric and water soluble sericin is discarded as waste which causes environmental pollution. The innovation relates to 1) the recovery of Silk protein sericin from effluent of silk reeling industries and further develop low cost product for various application "Generate Wealth out of Waste". 2) To control environmental pollution & Prevention of waste generation 3) Revenue generating model for reeling industry workers 4) Novel Application of sericin.

Innovative and cost effective approach of recovering Silk protein Sericin

Innovation ID	Tam(i)SPra551
Innovation Title	**Smart Real Time Automatic Activity Recognition System for Crime Detection and Prediction using Video Surveillance System and IOT**
Focus Area	Electrical Engineering
Innovator	Prabin Jose

In recent days most of the crimes are take place in public places. In India many large cities have crime and antisocial behavior problems, such as terrorist attack, vandalism, and fights. In all these cities the video cameras are installed but the lacking is automatic and instant monitoring and analysis of the video data. The need of good security is one of the key aspects in our modern life. There is no appropriate automatic security system to predict and identify the crimes and unpredictable attacks that is going to happen in a particular place. This innovation project consider this problem and focuses to design a smart system based on image and video processing techniques which will monitor and classify the activity, face expression and behavior of a person instantly in the recorded video .The abnormal person activity in the video is identified and the result is updated in the cloud. The cloud based services will share the information instantly to many people through internet and mobile App. So the higher officials and public peoples in the nation can access the system prediction decision and can take preventive measures accordingly.

Smart Real Time Automatic Activity Recognition System

Innovation ID	TamACTiNiv1455
Innovation Title	**It is an IoT-based Pre-monitoring of environment for military application**
Focus Area	Robotics
Innovators	Niveda B, Shanmuga Priya V, Shraddha Kamath, M.P. Chitra

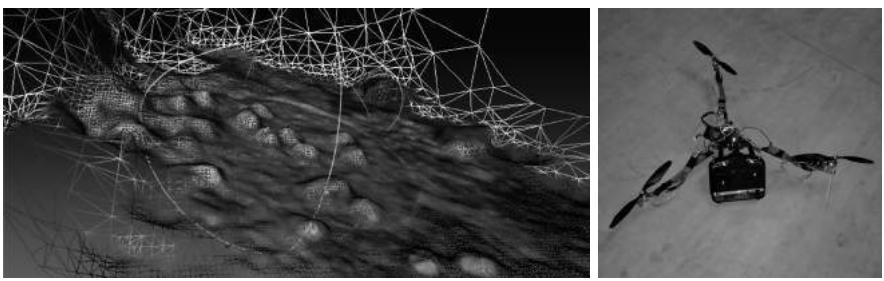
Robots play a major role in our lives and they are extensively used in the areas like defense, industries, medical and home applications. They can carry out different risky jobs that can help to save humans life. Our robot includes of LDR sensor for night vision automatic lightning, obstacle avoidance using Ultrasonic Sensor, Human detection using PIR sensor. The robot provides continuous visual monitoring through the wireless camera attached to it and sends continuous data to the database, automatic edge detection so that robot can protect itself from falling from heights. It can sense humidity, temperature, smoke and metallic bombs and hence immediately provide an alert through an E-Mail using IoT. We can also track its location using IP address.

Pre-monitoring of environment for military application

The Bot is a launch type. There are three ways of which launch of the bot has been designed depending on the distance of the launch. For the launch of fewer than 100 meters, The bot will be thrown along with a smoke grenade. The bot will start taking pictures once the smoke stops from the grenade. The bot has camera's (3 to 4) attached to it which continuously takes video and monitors the environment. Using Digital Image Processing, it processes and detects a human face and sends the location and count of human to the cloud and which can be viewed via a secured webpage. The Bot has wheels inwards which open up when it requires motion. The stability of the bot is maintained throughout. For the launch of more than 100 meters, a missile is used to launch the bot. The future prospect of the project involves of making this bot in the shape of the bullet and monitors the environment by shooting the bullet. We also consider the authentication side of the bot and we have made protections for the mechanism of the bot. If by chance the bot has been detected by unknown persons during the attack, the bot has the capability of self-destructing its mechanism which is controlled by Indian army in order to maintain safety so that fallacious data is not sent to the cloud.

Innovation ID	Tam3DR PAR1635
Innovation Title	**Design and Fabrication of Remote Area Mapping Tricopter**
Focus Area	Robotics
Innovators	Parthasarathy Ganesan, Rishikesh T K, Ramkumar P, Ambrish Babu S

The main objective of this project is to 3D map a given surface terrain from the pictures (2D images) of the same from different perspectives. To take such images a tricopter (A drone with 3 limbs) is being used along with a Raspberry Pi and a Camera to take pictures. Always a drone becomes a natural choice to take images from various positions and different heights, but a tricopter is advantageous when it comes to stability of camera and angle of view of the camera. The 3D mapping is done with the help of a image processing software named "Bundler" and further that model is again processed using Poisson's Surface Reconstruction to get a model suitable for 3D printing.



Remote Area Mapping Tricopter

Innovation ID	Mah1. Nil1537
Innovation Title	**Design And Development of Garlic Peeler Machine**
Focus Area	Agriculture
Innovators	Nilesh Parashram Awate, Pratik khadode, Ashish bais, Akash Saraf

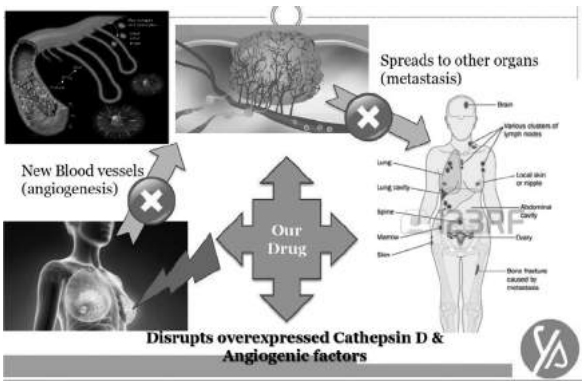
The garlic peeling machine is a continuous working apparatus to break and peel whole garlic pods and to output individual peeled garlic petals. The hopper directs the garlic pods into a strategically placed peeling chamber consisting of a drum of circular cross section and a central rotating shaft to which a number of rubber blades are connected. The blades are so arranged in the chamber that the falling garlic pods are caught in their wake and are impacted onto the chamber walls. During this process mechanical skin friction as well as the impact loosen the peel of the garlic pod. The mechanism also provides flexibility in terms of capacity to handle varying sizes of garlic. Consecutive passes across the arranged rubber blades breaks the garlic pods into individual petals and loosen the peels. The loosened petals are then sent to a chamber where the peels are separated from the petals using an air blower.

Design and development of garlic peeler machine

Innovation ID	AndTherYog471
Innovation Title	**Novel Drug Candidate For The Treatment of Breast Cancer Including The Triple Negative Type**
Focus Area	Bio Pharma
Innovators	Yogeeswari Perumal

Breast cancer is the MOST COMMON CANCER in women all over India and accounts for 25% to 31% of all cancers in women globally. Approximately 15% of all breast cancers are diagnosed as triple negative breast cancer (TNBC)- an aggressive subtype. Currently TNBC has no treatment option except chemotherapy and surgery.

In our recent study, we have identified a therapeutic target, a lysosomal protease expressed not only in ER/PR positive, HER negative cell lines, but also in triple negative breast cancer cell lines. With this in place, we had identified promising drug candidates effective as lysosomal protease inhibitors with promising anticancer profile in a panel of breast cancer cell lines including TNBC cells. Further the candidate drugs exhibited antiangiogenic properties tested in-vivo in a zebra fish model.



Novel Drug candidate for the treatment of Breast cancer

Innovation ID	MahIn IVEN1347
Innovation Title	**Greenvillips Vintage**
Focus Area	Nanotechnology
Innovators	Venus Mohan Chaudhary, Apurv Madhusudan Mhatre, Akanksha Ravi Parkash Agarwal

Utilization of waste for producing something valuable is one of the principles of Green & Sustainable Technology. Our process deals with utilizing industrial waste for production of Nanocellulose. Nanocellulose has remarkable properties and enormous applications in various sectors of industries.

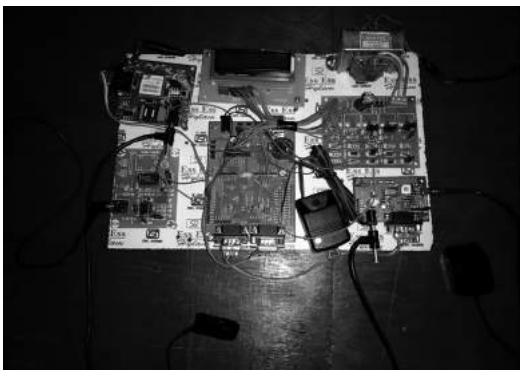
The process designed is innovative, green and sustainable. It utilizes crude glycerol from industries. It is a by-product of Biodiesel process. Supply of glycerol is high and the demand is low leading to problem of its disposal.

The process incorporates bacteria to consume this industrial waste and synthesize Nanocellulose as fermentation product. All the process parameters are specifically studied, monitored and designed for higher yield. The resultant Nanocellulose has high purity and applications. We also have a downstream technology for purification of the produced Nanocellulose and converting the Nanocellulose to aerogel. This aerogels are successfully tested as membranes for air purification applications in our prototype

Greenvillips Vintage

Innovation ID	TamNo mVij1423
Innovation Title	**A Collision Detection And Automated Pulse Monitoring Helpline System**
Focus Area	Electrical Engineering
Innovators	Vijay Prasath, Naveen, Vinoth Chander, Dr. L.M. Merlin Livingston

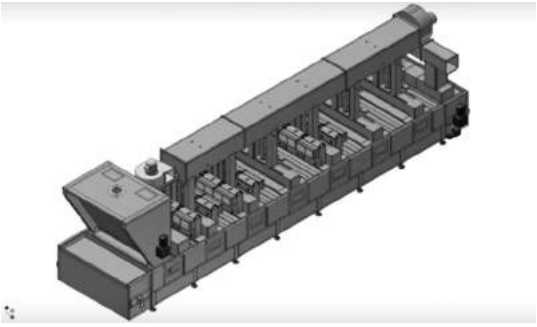
The system envisioned is an automatic collision detection and automated helpline system relying on a GPS module and a GSM modem. The vehicle is to be fitted with the system sturdily ensuring good mechanical coupling with the entire chassis. In the case of an anticipated accident, the system detects it using the fact that the vehicle would be suddenly decelerated in such a condition. A vibration sensor continuously monitors the vibration of the vehicle and will detect the vibration greater than threshold value and send the data to the microcontroller. The controller compares this with the threshold set value and immediately monitor the pulse of the driver by a heartbeat sensor fitted to the driver's finger and if the heartbeat is abnormal it sends an SOS message to preset numbers. With this message the controller also transmits the GPS coordinates of the vehicle which it continuously obtains from the GPS module. This system will also highly aid the search and rescue of vehicles that have met with an accident.



A collision detection and automated pulse monitoring helpline system

Innovation ID	ChaIndiNit1048
Innovation Title	**A Multi-Scale Machine For Indian Gooseberry (Amla) Drying In Candy And Sintering In Powder Manufacturing Process**
Focus Area	Food Technology
Innovators	Nitin, Chanpreet Singh, Himanshu Jindal

Gooseberry (Amla) has come up as healthy antioxidant fruit in recent years and the processed gooseberry in different form has got tremendous market in India. The process already used by FMCG companies working in the area of amla candy and power production (viz. Patanjali) are suffering with bottleneck of time needed for drying. The conventional processes use sun-light at smaller scale and using hot air at industrial scale generally for drying purpose. It is estimated that conventional industrial process takes 18 hours to produce 1 ton of amla candies and which is quite less in meeting the current market demands for the product. It offers 1 ton/hour and hence 18 times faster, 17 % more energy efficient and almost half in cost in comparison the conventional methods in addition to more nutrient content candy and powder. Since farmers sell the amla at the price of 2-5 Rs./KG and candy or powder in the market is available at the price of 250-400 Rs/ KG and hence the lesser capacity unit is offered at quite affordable price to farmers.



A multi-scale machine for Indian gooseberry (Amla) drying in candy and sintering in powder manufacturing process

Innovation ID	MahThe NEE207
Innovation Title	**Low Cost, Easy To Install, Battery Operated, Highly Energy Efficient Pir/Ir Based Ceramic Auto-Tap System**
Focus Area	Agriculture
Innovators	Neeraj Dnyaneshwar Darwai

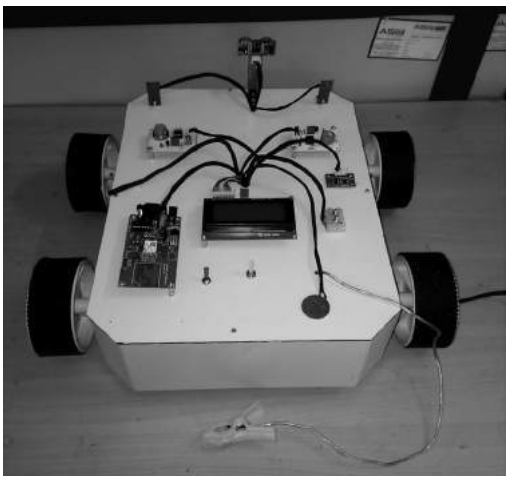
Water conservation is a need of hour and on contrary ample of water go waste in personal and public tap systems. In this regards, in the proposed automatic tap system a smart combination of PIR with IR is used for long lasting battery performance. A single tap unit consist all the assembly envelop in an aesthetic outer looks, thus making it a simple single unit for mounting on existing basin.

In proposed product, hybrid use of PIR and IR based actuation is projected, resulting into long lasting single charge operation. Here the very low wattage PIR circuit board (0.1 W) is only active component in idle state. On working part, PIR sensor detects the hand movement which then activates the IR based circuit and then relay activates the solenoid valve for water flow. On contrary, the flow is terminated when hand is removed. Additional timer is provided for timed operation.

Low cost, easy to install, battery operated, highly energy efficient PIR/IR based ceramic Auto-Tap system

Innovation ID	TamFittNiv1405
Innovation Title	**Avoidance Of Accidents And Speed Control Of Vehicles Using Advanced Technologies (Multisensors And Controllers)**
Focus Area	Automobile Engineering
Innovators	Nivashini Elanchezhian, Preethi Karunakaran, Poornimaa Ravindran

The objective of our project is to develop a prototype model to keep a Vehicle secure and avoid accidents while driving by using multiple sensors and controllers. Traffic accidents are one of the leading causes of fatalities in India. There are several methods already exists to avoid accidents by using sensors and controller setup incorporated inside the Vehicle. Our proposed method also uses various (multiple) sensors to detect the threshold levels and give a feedback by providing alarm using microcontroller circuit. Accident due to

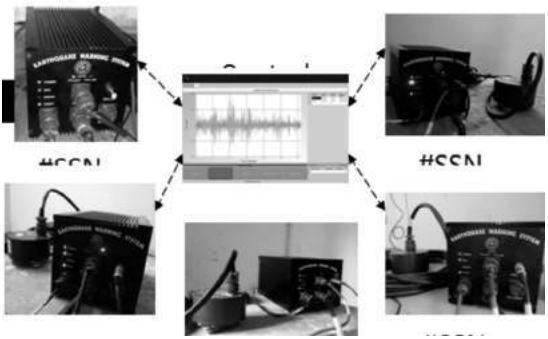


Avoidance Of Accidents And Speed Control Of Vehicles Using Advanced Technologies

drowsy is prevented and control when the vehicle is out of control and also the drunken driver prevented by installing alcohol detector in the vehicle. The term used here for the recognition that the driver is drowsy is by using eye blink of the driver. The drowsiness is identified by the eye blink closure and blinking frequency through infrared sensors. The alcohol consumption is verified during the starting process of the vehicle using alcohol detector. If any accident occurs , microcontroller send the data to base or surveillance unit via SMS using GSM modem .GSM and GPS based vehicle location and tracking system will provide effective real time vehicle location mapping and porting the information value. Body Health parameters (heart rate, blood glucose level, body temperature) can also be continuously monitored using the corresponding sensors. When an anomaly is found in the above parameters, the car fails to start and gives the warning indication. The ultrasonic sensor system continuously sends signals and monitors any car or other obstacles are in front of car. We have developed a prototype model which is simple and can mimic the performance of an actual system that aims to implement in real time.

Innovation ID	Chai. GRip959
Innovation Title	**Earthquake Warning System (Eqws): A System For Regional Notification of A Substantial Earthquake**
Focus Area	Electrical Engineering
Innovators	Ripul Ghosh, Ashish Gaurav, Siddhartha Sarkar, Amarendra Goap

The Earthquake Warning System (EqWS) is devised for regional notification of a substantial earthquake during its impending. It is an IoT based smart framework consisting of Central Control Unit (CCU) and at least two geographically distributed Seismic Sensing Nodes (SSN) deployed fencing the warning sites or at the vicinity of seismic fault zones or comprising of both. Each SSN consist of strong motion accelerometer sensor, signal processing unit, communication module with GPS timing. The real-time intelligent seismic event detection technique provides local event recording and communicate to CCU along with health information of all SSNs. A decision support is devised at CCU based on the response of all the individual SSN and generates an audio visual alarm and sends the on-going earthquake event details via email and SMS to the public/registered users. The system can be used at vital and strategic utilities such as nuclear power stations, hydro dams, running of bullet trains and smart cities



Earthquake Warning System

Innovation ID	TamHeroDYA1505
Innovation Title	**Design And Implementation Of Hybrid Electric Vehicle Using Wind Energy Source**
Focus Area	Electrical Engineering
Innovators	Dyaneswaran A

In this project, a new approach of wind energy based hybrid electric vehicle (Motor cycle) is proposed. With increasing fuel cost its availability is getting reduced day by day, All automakers are seriously working on developing a standard hybrid vehicle with low maintenance, low fuel emission, good comfort, user friendly and good drivability etc., but there are many disadvantages and difficulties in designing Hybrid Electric vehicles. The energy storage system i.e. battery bank needs more care for its efficient functioning. The design of wind turbine in wind powered HEV should not drag the vehicle for its forward flow because, it affects the performance of the ICE (Internal Combustion Engine). The wind turbine has to be designed for this particular application and placing these wind turbines on vehicle is to be given equal importance.

Innovation ID	DelIn sSan1417
Innovation Title	**Sphere: A personal post emergency response system for vehicles loaded with different security features and services to provide all round protection for vehicles making car owning a secure and safe endeavor**
Focus Area	Healthcare & Sanitation
Innovators	Sanchit Gupta, Shrey Miglani, Rohan Sharma

Sphere: A personal post emergency response system for vehicles loaded with different security features and services to provide all round protection for vehicles making car owning a secure and safe endeavor.

5 lakh people injured, 1.4 lakh killed in India in road accidents in 2014. Additionally, 2 lakh automobiles are stolen in the country every year. These numbers have been increasing at an exponential rate. The statistics show that 50% of the accident victims could have been saved if timely medical aid had been provided within the golden period.

Our device, Sphere, provides personal emergency response in case of accidents or in any other medical assistance, combined with anti-theft system and on-road assistance. Whenever an accident occurs, the nearest hospitals are informed instantly. Help can also be demanded manually at the press of a button. The elaborate anti-theft system includes Remote Ignition Control, GPS Tracking, Automatic Car Slowdown and Shock and Vibration Detection. Sphere fits in the rear-view mirror, where it is easily accessible. The technology used in the same is highly reliable and has evolved through years.

Innovation ID	TamZhecV.V1488
Innovation Title	**Semi-Automatic Groundnut Harvesting Machine**
Focus Area	Agriculture
Innovators	V.Vignesh, S.Aravind, K.Sastha, M.Fahimul Ashim

A venture to design a semiautomatic groundnut harvesting machine of optimum size and reduced cost of the machine is our main aspire. The reason for this project to be chosen is that the farmers are facing a lot of trouble during the harvesting of the groundnuts and also the loss of machines in the field of agriculture. The conventional groundnut harvesting machines are larger in size and are very costly, that the farmers are not able to afford to buy the machine. This is the reason that the Southern part of India still depend on the labor force for harvesting the groundnuts. In order to overcome all the drawbacks that are present now, we have made an initiative to develop a machine that rectifies the problems that the conventional machine has. The machine that we had done is tested in the field and had good response among the farmers.

Semi-Automatic Groundnut Harvesting Machine

Innovation ID	AndTherGan802
Innovation Title	**FreightBazaar – First Integrated Inter-City Freight Transportation Platform"**
Focus Area	Transportation & Logistics
Innovators	Ganesh Ramchandra Rewanwar, Bhaven Shashikant Shah

FreightBazaar is India's 1st Integrated Inter-city Freight Transportation Platform. Key problems in the $50Billion USD inter-city Indian freight transportation industry are related to supplier reliability, cost efficiencies and fleet utilization. These are precisely the areas where FreightBazaar platform is bringing positive disruption through its innovative model, technology automation and superior operational excellence. Through a unique B2B Saas-Cum-Marketplace platform where freight prices are negotiated through open reverse bidding process, shippers save both money and time. The entire process from initial posting of requirements, competitive bidding, confirmation, trip management, performance rating, payment are automated. On the supply side, FreightBazaar not only provides regualar

"FreightBazaar – First Integrated Inter-City Freight Transportation Platform"

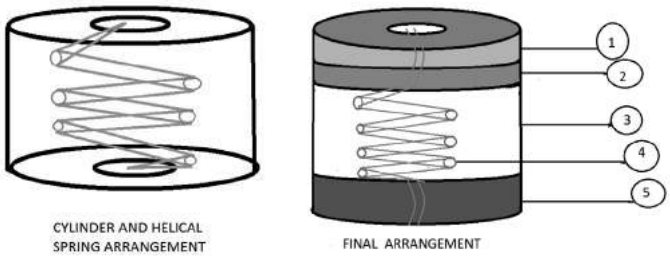
loads to Truck owners but also enables them with various technology tools such as mobile apps, driver apps, GPS devices, Analytics, Fleet Management etc. Winner of 2 industry awards in the past year, FreightBazaar has serviced over 100 routes across India. There are 15000+ trucks available through the platform. Many supply chain companies, 3PL and logistics players, FMCG and housing sector firms, both large and medium sized, use FreightBazaar to bring efficiency, transparency and convenience to their inter-city transportation units. The platform also received apprciation and accolades by Clean Air Asia (www.cleanairasia.org) for its role in in reducing Transport related emissions.

Innovation ID	MahNilHom1453
Innovation Title	**Rubber Suspension system**
Focus Area	Mechanical Engineering
Innovators	Homeshwar Nagpure, Sachin Karandikar

This invention relates generally to direct acting shock absorbers and more particularly to a improved and inexpensive rubber shock absorber in a single tube or cylinder type. The primary object of this invention is to provide a shock absorber wherein the major components are made of rubber material and which shock absorber is of a relatively simple and inexpensive construction. Other objects and advantages of the device of this invention will become apparent from the following detailed description of the invention taken in conjunction with the accompanying drawing which is a longitudinal sectional view of one embodiment of the shock absorber of this invention.

While it will be apparent that the preferred embodiment of the invention disclosed is well calculated to fulfill the objects above stated it will be appreciated that the invention is susceptible to modification, variation and changed without departing from the proper scope on fair meaning of the sub joints claims.

This type of shock absorber will be placed at the front side and back side of the conventional bicycles which will provide more comfort to the person riding the bicycle. Generally this type of bicycles is mostly used in village areas where the villagers have to deal with rough roads regularly.



Rubber Suspension system

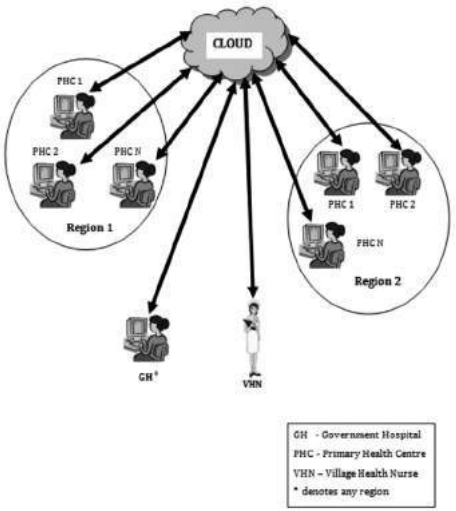
Innovation ID	Kar• Gau1123
Innovation Title	**Universal accessible keyboard for visually impaired for easy smartphone use and adoption**
Focus Area	IT & Ites
Innovators	Gaurav Mittal, Shaswat Ranjan Jena

Eye-D Keypad is designed empathizing various smartphone accessibility issues with a vision to elevate smartphone usage experience for visually impaired. Smartphones today are capable of addressing diaspora of needs but using and getting accustomed to it is still a nightmare for our visually impaired (VI) counterparts. The touch screen phone which relieves us from keypress add a whole new level of inaccessibility for them. We have developed Eye-D app that helps a VI know his location with respect to landmarks, explore nearby places, identify objects, evaluate surrounding and read printed text too. Eye-D app leverages the existing smartphone ecosystem to improve VI quality of life. Smartphones when coupled with the accessible Eye-D keypad and Eye-D app open doors for digital inclusion and provide easy access to the digital world.

Innovation ID	TamTherA. 1336
Innovation Title	**Biometric Assisted e - Health Record for Pregnant Women and Chronic patients linking Primary Health Centres (PHCs) and Government Hospitals using Cloud Computing**
Focus Area	Healthcare & Sanitation
Innovators	Babu Karuppiah, R. RajaRaja, Praveen. B, Tarun Nishanth. U

As per statistics of Census 2011, the literacy rate is 84.1% and 67.8% for urban and rural population respectively. The Primary Health Centres (PHCs) in the rural community has issued a health card for the benefit of the educationally challenged patients. They lose the card or ignore it not understanding the usefulness of it. So, the doctors find it very hard to treat them, as the previous history of patients listed in the health card is made unknown.

This project aims to create a biometric assisted user friendly e-Health Record maintenance application that caters to patients of age above 18. The complete medical details of the patient are stored in a secured cloud. This makes the application link government hospitals and PHCs. The developed application reveals the confidential information of the patients only to the physicians and also render better services to the pregnant women and chronic patients of PHCs.



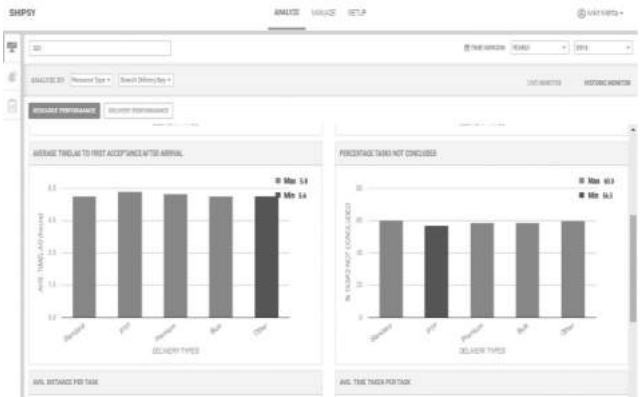
Biometric Assisted e - Health Record for Pregnant Women and Chronic patients linking Primary Health Centres (PHCs) and Government Hospitals using Cloud Computing

Innovation ID	HarLogiSoh1390
Innovation Title	**Big data analytics for logistics**
Focus Area	Transportation & Logistics
Innovators	Soham Chokshi

The supply chain industry has always been plagued with the problem of visibility, and this becomes an even bigger issue for the logistics space with end customers demanding higher service levels every day.

We have a Dashboard along with a companion android application. The Dashboard is used by Operations managers and the Central team. It is capable of performing end to end functions such as operations monitoring, customer care, operations management, booking and strategic data driven decision making. The android application is used by the field force and is synced with the central dashboard which pushes tasks etc. The android app works perfectly well in patchy or no internet zones as well.

We have also adopted the strategy of differentiating our core production infrastructure from the big data infrastructure which enables to have a much deeper focus on analytics – differentiating us from our competitors.



Big data analytics for logistics

Innovation ID	DelGoogmad1331
Innovation Title	**Navyo-The Smart Glove**
Focus Area	Electrical Engineering
Innovators	Suhail, Mohd. Suhail, Bhavesh Pachnanda

Today, in the midst of our fast paced life and era of technology, a visually impaired person is still in a state of confusion-How to reach the destination. While walking on street, the fellow is unable to identify the appropriate direction i.e. from where to take a left or a right turn and unknowingly enter into wrong lanes. To cater this problem, we created Navyo - The Smart Glove that aims to provide turn by turn navigation via vibrations to a visually impaired person at an affordable cost. Existing solutions for such issues are largely audio based. These systems lack the ability to operate in noisy environments and are susceptible to latency in communication. Our surveys have shown that the visually impaired are more responsive to haptic feedback over audio feedback. We believe that our product is the next logical step in the evolution of such devices and revolutionize the assistive technology industry.

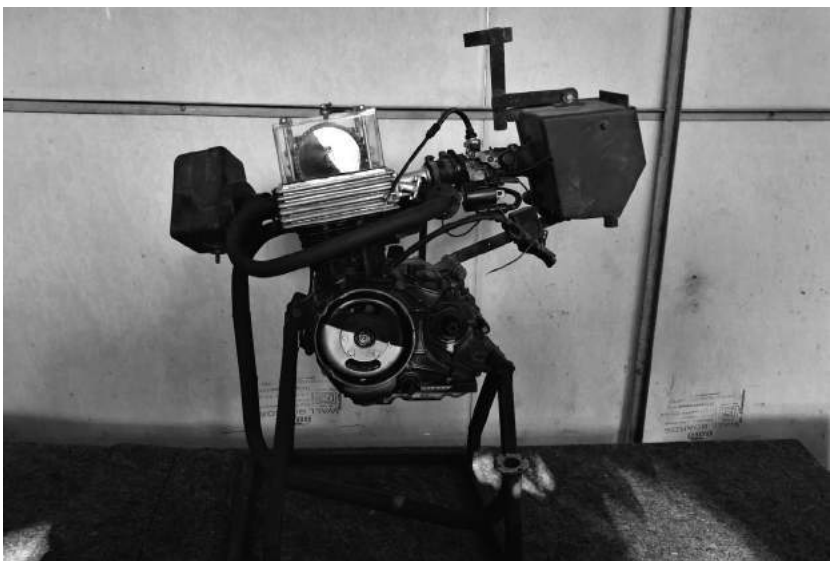
Navyo-The Smart Glove

Innovation ID	MahlTeSamo1328
Innovation Title	**Secure Health Monitoring And Controlling System using NFC technology and cloud computing**
Focus Area	Healthcare & Sanitation
Innovators	Amol Dnyaneshwar Potgantwar

Data sharing structure based systems such as online networks of Healthcare Application System etc. has huge demands for distributed data security and efficiency. Use of NFC (Near Field Communication Technology) and a new proposed Ciphertext policy attribute based encryption (CP-ABE standard scheme) in HAS (Healthcare Application System) provides these aspects very well and removes drawback of existing key escrow problems. NFC is a wireless technology operates very close distance of each other less than 3.9 inches or less and stores a unique identification number in it. The CP-ABE encryption standard scheme is becoming a significant alternative in cryptographic standard for data storage center security. The proposed CP-ABE standard scheme provides an improved performance and efficiency with the use of secure element in the Key-Gen, cpabe-enc and cpabe-decoperation.

Innovation ID	KerTherAni390
Innovation Title	**Reciprocating Multi Cycle Engine**
Focus Area	Automobile Engineering
Innovators	Anil Chanayil Cleetus

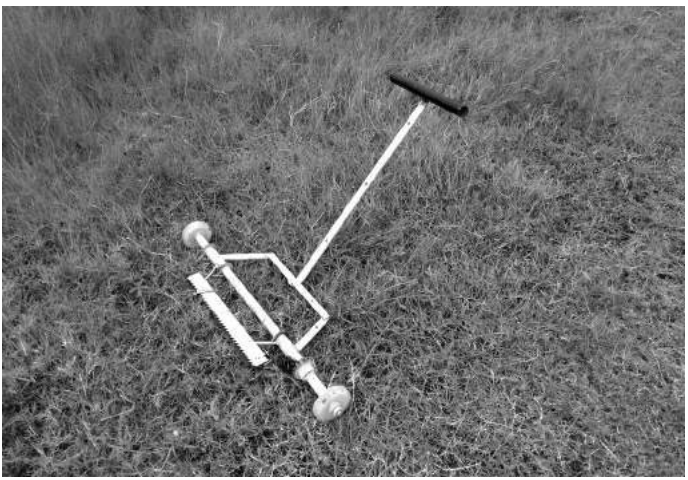
The present invention relates to reciprocating multi-cycle internal combustion engine which will have the combined working of both six stroke engine as well as four stroke engine technologies in the same cylinder. The advantages of both the engines can be obtained from an engine from the same cylinder. Conventionally IC engines are used for powering mechanisms in various applications. Two different values of torque can be achieved at the same RPM by running the same engine in either six stroke or four stroke cycle modes. The six stroke engine can be made to operate in four stroke cycle by using valve operating methods controlled by electrical, hydraulic, pneumatic technology.



Reciprocating Multi Cycle Engine

Innovation ID	Tamonlyara1185
Innovation Title	**Multi agricutter is an alternative for large expensive machines used in harvesting process. it enables better performance of small scale agriculturists.it saves lot of time and work in a price affordable by all.**
Focus Area	Mechanical Engineering
Innovators	Aravindh, Anandhsamy, Balaanandh

Even modern day agricultural activities involve huge part of investment in labor. Labors were employed for processes such as harvesting and related sub processes. This involves large machinery or labors in large numbers. Multi harvester functions by utilizing the rotary motion being derived from the wheels during movement.



Multi agricutter is an alternative for large expensive machines used in harvesting process.it enables better performance of small scale agriculturists.it saves lot of time and work in a price affordable by all

The rotary motion is transmitted at right angles using bevel gears. The rotation is being manipulated to suitable level using compatible gear ratio. The pinion rotation is converted into reciprocating motion. Conversion of rotary to reciprocating motion is done using three bar linkage setup. An eccentricity is provided on the pinion. This eccentricity is linked to subsequent links and thereby connected to reciprocating blade. A stationary blade is arranged relative to reciprocating blade. During rotation of the wheels the gears rotate and this causes the pinion to rotate. Eccentricity enables the reciprocating blade to reciprocate. The crops are being cut in between the gaps of stationary and reciprocating blades.

The setup is associated with no power need hence results in better financial approach for small scale farming applications. Only mechanical work is employed in its functioning. The diameter of the wheels and gear mean diameter were selected with minimum possible difference by which better functioning is achieved due to the fact that more strokes are completed for relatively small distance coverage.

Innovation ID	DelZeroAkh1202
Innovation Title	**Zerodor waterless Urinal kit is a plumbing attachment which eliminates the mechanism of flushing and controls odour. Thereby saving 50000 to 150000 ltrs of water per urinal per year**
Focus Area	Healthcare & Sanitation
Innovators	Akhilesh Ahirwal

Zerodor, a patented and proprietary technology of IIT Delhi and Ekam is a completely non consumable and non chemical based mechanical device. The device solves a typical contradiction of "The liquid should pass but the gas should not". Zerodor can be retrofitted in most of the standard urinals and does not require any change in existing pan, if they are compatible. The device is fitted in the drain plug of the urinal pan. The intelligently designed mechanism of Zerodor allows the liquid (urine) to pass in the drain pipe and blocks odour causing gases (coming from the drain pipe). Zerodor saves anything between 50,000 to 1,50,000 liters of fresh water per urinal per annum.

Zerodor waterless Urinal kit is a plumbing attachment which eliminates the mechanism of flushing and controls odour. Thereby saving 50000 to 150000 ltrs of water per urinal per year

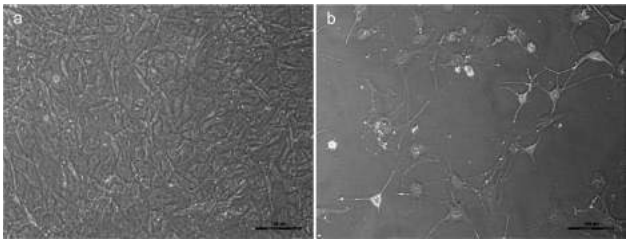
Innovation ID	KarNoneNag925
Innovation Title	**Energy Produced From Solar Panels By Parabolic Reflector With Space Efficiency**
Focus Area	Energy
Innovators	Nagaraj N

Energy produced from solar panels by parabolic reflector with space efficiency" is a newly developed concept consisting of 3 solar panels arranged in a triangular based prism frame, a parabolic reflector to reflect sun's radiation supplemented with height adjustment and sun tracking mechanisms, developed and fabricated to cut down on the space requirement to nearly 1/3 or to harness the power nearly 3 times for the same given space without compromising the energy output, unlike the large space consuming existing solar energy systems. By virtue of its geographical location, India can be a pioneer in harnessing solar energy if utilized efficienty given uncomparable 300 clear sunny days a year. Population explosion, increasing power demand, high cost factor involved in other power generation processes and limited renewable resources which are on the brink of extinction in years to come, solar energy harnessing with ever evolving technologies will stand test of time and serve the human race for ever.

Energy Produced From Solar Panels By Parabolic Reflector With Space Efficiency

Innovation ID	PunCellVar1049
Innovation Title	**Neuronal Cell Lines Produced From Non-Neuronal Cell Lines Using Walnut Oil**
Focus Area	Bio-Chemistry
Innovators	Varsha Singh

Animal cell culture is proving to be of great diagnostic value as specific cells can be grown, tested or produced without using human trials or laboratory animals. Researchers worldwide are procuring cell lines to carry scientific research to test efficacy of drugs, to diagnose toxicity of compounds and diseases. Kidney, liver, pancreas cell lines are available for testing and research, however, brain cells are much in demand due to high rise in brain related diseases and disorders. For this, the present invention was designed to covert mouse bone marrow cells into brain cells using walnut oil. One major problem faced by researchers is that neuronal cell lines of good quality are exported from cell culture repositories abroad. The cell lines procured from foreign countries is not only difficult to handle but expensive (~1 lakh or above). Rather than using expensive induction materials (costing 1000X less than procuring neuronal cell lines), walnut oil can be used as a neuron induction agent to produce inexpensive neuronal cell lines to be available for researchers worldwide at just Rs. 100. Among the end users, the pharmaceutical and biotechnology companies segment is expected to grow at the highest CAGR (Compound Annual Growth Rate). Coming up are also users in the neurotherapeutic companies which have also utilized specific neuronal cell lines to study neuronal disorders. Therefore, the global cell culture market is expected to reach USD 18,630.7 Million by 2020. Asian countries will be seeing a tremendous growth especially India, Japan and China by 2020.



Neuronal Cell Lines Produced From Non-Neuronal Cell Lines Using Walnut Oil

Innovation ID	MahNo eKau859
Innovation Title	**Continues Passive Machine (CPM) for Elbow**
Focus Area	Healthcare & Sanitation
Innovators	Kaustubh Joshi

Continuous passive motion (CPM) was proposed as an orthopedic treatment and a physiotherapy method that promotes recovery from the injuries after surgery of joints. The CPM is intended to correct range of motion (ROM) and is more an adjunct to the conventional treatment method. Modern Continuous passive motion (CPM) is a widely used postoperative treatment method that is designed to aid recovery after joint surgery or injury. It can lead to a reduction in both hospital stay and analgesic requirement and accelerates the recovery process. In many physiotherapy centers the use of CPM is limited by the cost of the equipment. In the present work, we have design and develop the project of Low Cost Elbow CPM Machine with the energy conservation point of view & with advanced heating and cooling effect.

Continues Passive Machine (CPM) for Elbow

Innovation ID	KerIn tAJI977
Innovation Title	**Latinno – Latex Carry Backpack**
Focus Area	Agriculture
Innovators	Ajin Omanakuttan, Abi Varghese

We are living in a world which is in constant flux. World nations are aiming towards a well developed condition. So the current urbanisation, industrialisation becomes fast. World moves fast. And the necessity for Natural Rubber is increasing day by day. The usage of (latex) natural rubber extends from large scale industries of tyre, tread, mats to the healthcare industry etc

We are presently following the traditional method of using aluminium metal buckets to collect latex. It is uncomfortable since we need to bend down frequently for collecting the latex which leads to more consumption of time. It involves a lot of strain and causes body imbalance and other health issues such as body pain, spondylosis etc. the quality of latex will be affected due to the mixing with rain water, dew drops and other solid particles, as the container is opened. These leads to huge economic loss which makes the rubber cultivation difficult in terms of economic and physical conditions. Moreover the spillage losses will arises due to the fall out of the latex out of the bucket due to accidents and the surface texture of the collecting area. It is needed to hold heavy latex collecting bucket on one hand for several hours while walking and it is very hard to carry the bucket through hilly terrain of rubber plantations.

Innovation ID	UttAs pGOU869
Innovation Title	**Hand Gesture Based Writing Support System for Blinds**
Focus Area	Electrical Engineering
Innovators	Gourav Modanwal

The proposed innovation will help blind community to interact with a computer which is a major hindrance in blind's education. Braille and other conventional methods have limitations while interacting with the computer. To solve this problem a new method and system is proposed in this innovation. This innovation will help more than 15 million blinds residing in India.

A new dactylology is proposed with the help of psychological study on blind peoples. More than 12,400 questions were asked and analysed in this study to select gestures based on performance and preference measure metrics. Further, a robust recognition system is also proposed to recognise gestures in the proposed dactylology. A new feature extraction technique, reduced shape signature (RSS), is presented which is simple, compact and invariant to rotation, translation and scaling. The prototype of the system is provided with an audio output to support run-time feedback to the users.

Hand Gesture Based Writing Support System for Blinds

Innovation ID	TamnoK.K554
Innovation Title	**Machine for removing cotton from kapok fruit**
Focus Area	Agriculture
Innovators	K.K.Vijethkannan

The mechanical cotton removing is a machine that automates to remove the cotton in a way that reduces time and maximizes efficiency. To develop a mechanical cotton removing with the intent on replacing manual labour. Because cotton can affect you when breathed in and it can irritate the nose, throat and lungs. Repeated exposure can cause serious, permanent lung damage(byssinosis) with chest tightness, difficulty breathing, coughing and wheezing

Our cotton remover is a semi-automatic machine that removes cotton by using cutter that rotate at moderate speed and remove the cotton from the kapok fruit. The purpose of this project is to remove the cotton from kapok fruit in order to reduce the human power or work. We hope that ,project is helpful to farmers and also to workers

Machine for removing cotton from kapok fruit

Innovation ID	PonMNC Abd828
Innovation Title	**Aqua horse-a portable onshore device to converts ocean energy into usable clean energy for fishing community and commercial establishments along the seashores. Primarily designed to run cold storage on clean energy extracted from ocean**
Focus Area	Energy
Innovators	Abdul Thameem

Aqua horse - a portable onshore device to converts ocean energy into usable clean energy for fishing community and commercial establishments along the seashores.

Primarily designed to run cold storage on clean energy extracted from ocean Fisheries in India is a very important economic activity and a flourishing sector and heavily contributes to the Gross Domestic Product .India has 7517 km of marine coastline, 3,827 fishing villages. Despite rapid growth in total fish production, a fish farmers' average annual production in India is only 2 tonnes per person. Fish harvest distribution and Fisherman's per capita can be improved tremendously by introducing cold storage microgrids Aqua horse will power Cold storage microgrid through clean energy extracted from oceans.

Aqua horse

Innovation ID	ChaWe aVik826
Innovation Title	**Catheter Reprocessing System**
Focus Area	Healthcare & Sanitation
Innovators	Vikram Goel

Catheter Reprocessing System (CRS) is an angiography/angioplasty catheter cleaning machine. It is a fully automatic computer guided system with inbuilt self-testing and calibration with guaranteed cleaning.

CRS is a cost effective & quality assured way of reprocessing catheter. It also reduces infection and eliminates human error.

CRS can save millions of lives by making healthcare affordable and accessible for all sections of society. It reduces overall treatment cost up to 55%. This will especially benefit economic weaker sections of the society.

CRS is as per the vision of Sh. Narender Mod Ji (Prime Minister) and has following benefits:

- Affordable Treatment: Safe, Affordable & Accessible treatment for economically weak people.
- Make In India: 100% make in India & indigenously developed.
- Swach Bharat Abhiyan: Creating less medical waste, more re-use and safe disposal.
- Reduces import of catheter by 90%.
- Eco-Friendly and Green Technology.

Catheter Reprocessing System

Innovation ID	TamTo bKum803
Innovation Title	**VISUALMATH - Interactive Mobile App for Children with Hard of Hearing for Learning Mathematics**
Focus Area	IT & ITes
Innovators	Kumar R, Vickneswaran, Sudarsan

Learning for Children with Hard of Hearing (CWHOH) has always been a challenge. Researchers are now focusing on developing educational tools specially designed for them. However, as the level of difficulty increases, the fundamental concepts of math is getting difficult to convey concepts and make the children understand. CWHOH learn better when the concepts are visualized along with a verbal instruction. Demand for Such educational materials necessitates this work. The teachers and care givers find it difficult to visualize the mathematical concepts. VisualMath is addressing the challenges faced by these children and also assists their care givers & teachers by providing an interactive learning with fun filled in through simple games. It is an educational app designed to teach children of age group 3-6 years. VisualMath is an android mobile application which explains the concepts like numbers, shapes, colours, counting and simple arithmetic visually.

VISUALMATH

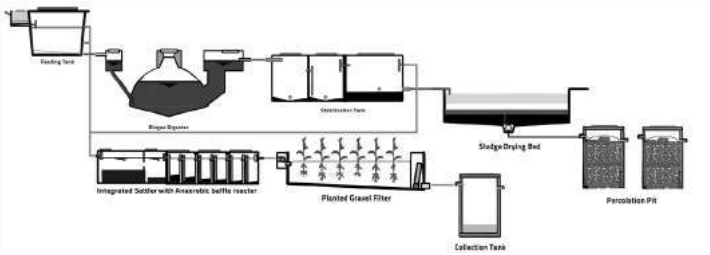
Innovation ID	KarThe Gam785
Innovation Title	**FSTP (faecal sludge treatment plant)**
Focus Area	Healthcare & Sanitation
Innovators	Gampa Nikhil, Isha Dash, Amresh Sinha, Kanakeshwar Kanakraj Devangan

The lack of Underground sewage networks in many Indian towns lead to use of onsite sanitation systems (OSS). OSS needs to be emptied using desludging vehicles over a period of time. But this desludged faecal sludge (FS) is illegally dumped in water bodies, open drains and farm lands. FSTP (faecal sludge treatment plant) offers solution to this problem which helps in better faecal sludge management.

FSTP operates on simple anaerobic and aerobic principles of wastewater treatment and helps in resource recovery. Following are the process principles of FSTP:

- Solid-liquid separation
- Anaerobic digestion of sludge
- Dewatering of sludge
- Liquid-fraction treatment
- Pathogen removal

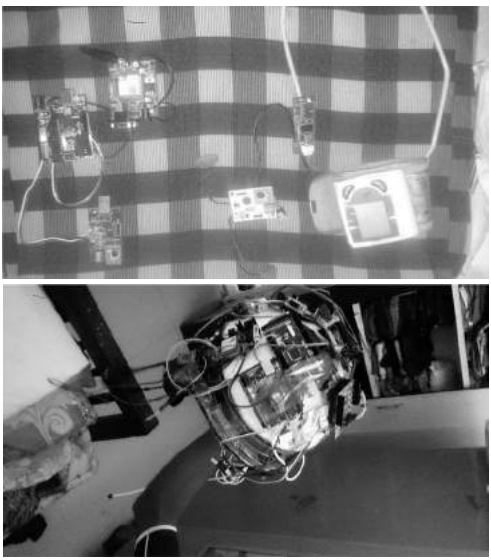
FSTP is cost effective since there is no presence of mechanical equipments to assist the flow and depends on gravity flow only thereby avoiding electricity consumption. It is to be noted that human contact with FS is minimal/avoided since all the modules are placed underground.



FSTP (Faecal Sludge Treatment Plant)

Innovation ID	Tamour s.s419
Innovation Title	**DEATH RATE CONTROLLER (PEOPLE RESCUE SYSTEM AUTOMATICALLY by ambulance WITHIN 5 mins during emergency in heart attack and accidents)**
Focus Area	Engineering others
Innovators	S Sivakumar

The project on Death rate controller is the implementation of smart helmet and smart watch,which helps to intimate to nearby ambulance driver when the patient is in critical such as heart attack, accident etc. In India death accounts due to heart attack and accidents are near to 65%. As of NDTV survey, delay in patient reaching the hospital are the major cause for these deaths. This innovation is all about taking the patient to hospital within 5min once the critical range is sensed in watch and helmet. Critical range is fixed in patient's blood pressure and oxygen level of blood parameters but there is a special condition occurs in accident where these are tends to be normal but the patient is dead by brain, these also been identified and intimated to ambulance, About 1 million people are dying due to this brain stem dead annually, all these are investigated and implemented in this project.



DEATH RATE CONTROLLER

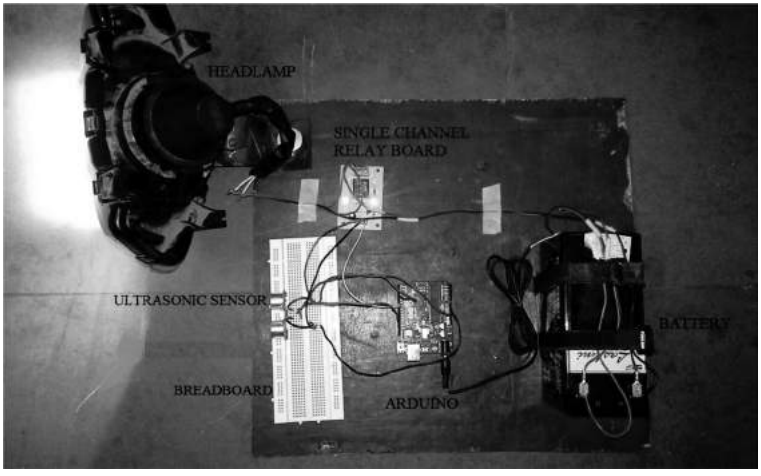
Innovation ID	TamNot Arv596
Innovation Title	**Industrial production of Charcoal through waste heat recovery process**
Focus Area	Energy
Innovators	Arvinth G

We have developed a technology for conversion of biomass to bio coal and thermal energy by low-temperature pyrolysis. The raw materials used are wood, coconut shells and any agri biomass. The entire process is designed to be environmental friendly with major reductions in green house gas emissions. Charcoal is used for producing activated carbon and in Ferro alloy industries as carbon agent and majority of the charcoal is produced by unskilled people through an age old method in an unsustainable manner with poor process efficiency. Unlike the traditional method where the waste gases are emitted into atmosphere causing pollution our retort captures the gas and converts into thermal energy. A part of this energy is used back into our process as fuel for heating and the excess heat can be used for industrial heating applications,steam generation, agro drying or setting up a cold storage.

Industrial production of Charcoal through waste heat recovery process

Innovation ID	TamTherArj566
Innovation Title	**Automatic High Beam Dimmer**
Focus Area	Mechanical Engineering
Innovators	Arjun, Rajesh yadav, Palani R, Dr. K. Arumugam

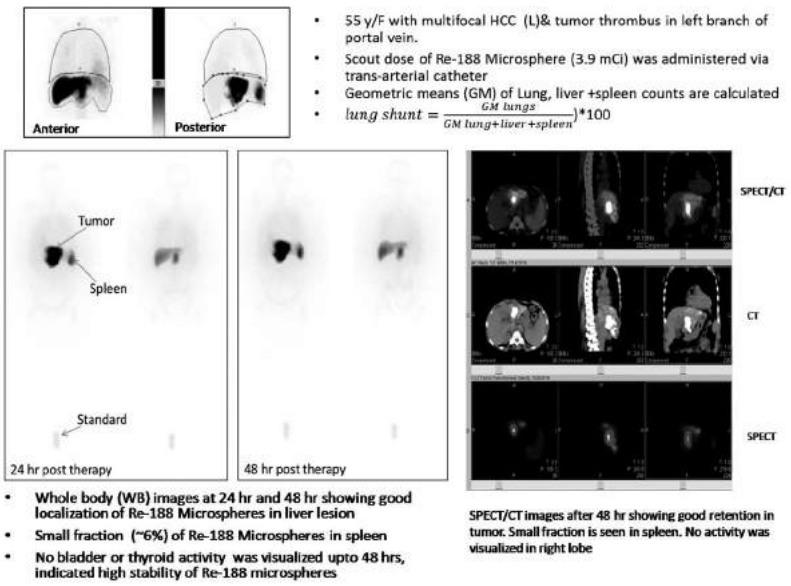
Automatic headlamps are the latest convenience in today's car. Headlights of vehicles pose a great danger during night driving. The drivers of most vehicles use high, bright beam while driving at night. This causes a discomfort to the person travelling from the opposite direction. This causes a temporary blindness called the Troxler effect. He/she experiences a sudden glare for a short period of time. An automatic headlamp dimmer system for switching a vehicle's headlamps from high beam to low beam when lights from another vehicle are detected in front of the vehicle. To avoid such incidents, we have fabricated a prototype of automatic headlight dimmer. This automatically switches the high beam into low beam thus reducing the glare effect by sensing the approaching vehicle. It also eliminates the requirement of manual switching by the driver which is not done at all times. The use of ultrasonic sensor has given importance in this field.



Automatic High Beam Dimmer

Innovation ID	Cha1. HJay215
Innovation Title	**Indigenous and cost-effective Re-188 microsphere formulation for selective intra-arterial radionuclide therapy (SIRT)of inoperable liver cancers**
Focus Area	Healthcare & Sanitation
Innovators	Jaya Shukla

Liver cancer is a leading cause of cancer deaths worldwide. When the patient is not suitable for available treatment options, e.g. large sized tumor, portal vein thrombosis; Intra-arterial radionuclide therapy may prolong survival and improve



Indigenous and cost-effective Re-188 microsphere formulation for selective intra-arterial radionuclide therapy (SIRT)of inoperable liver cancers

the quality of life. Such therapy delivers the radiation to the tumors via feeding hepatic artery and minimizes the radiation to normal liver parenchyma and other organs. The commercially available Y-90 SirSpheres/TheraSpheres therapy is beyond the reach of most of the patients (~8 lakhs). However, the radiolabeling of Re-188 lipiodol (~2 lakhs) with imported HDD kit is ~50% and urinary excretion is ~35%. So <40% of initially taken Re-188 retains in tumor. The proposed Re-188 microspheres are easy to prepare, highly stable and are very cost-effective (Rs 5000). The feasibility studies in patients (n=15) demonstrated good tumor retention and suitability of same Re-188 microspheres for lung shunt study before treatment. Small sized microspheres are not trapped in the lungs even if the lung shunt is present therefore reduces the chances of radiation induced pneumonitis. The initial data showed ~6% ID in spleen (helpful in maintenance of blood counts) and ~4% ID excreted through urine. No other extra hepatic accumulation is observed. These microspheres are well tolerated, easily administered through trans-arterial catheter. No reflux is observed. All treated patients, though having large lesions (>10 cm), showed necrosis/ size reduction and good clinical response. Kit based formulation has high potential market.

Innovation ID	TamTherC C359
Innovation Title	**Arduous Therapist A Hand And A Wrist CPM**
Focus Area	Mechanical Engineering
Innovators	C Cornelius Durai, T. David Thevaram, S. Sriram

A motorized medical instrument with the hand and the wrist supports along with the fingers is used to provide exercise for all type of patients including stroke patients, burn patients, paralytic patients, disuse atrophy patients, fracture patients who are immobile for long period. Our device is a portable one, so it helps the patients to do passive exercises at any places. The speed of the motor can be controlled as per the requirement of the patients. The dimensions of the device are given in a maximum limit and it can be adjusted with the Velcro we have provided near the splints.

Our motive is "To self-help the patients to overcome their disability through our automated device and to develop their self-confidence". Our device is made for the concern of all type of patients. We provide passive exercises for hands and wrists along with the fingers. For hands the device can do exercise by bending and stretching the elbow. For wrists and fingers a separate splint is designed for continuous moving of the whole unit. This helps the patients to do their exercises on their own without depending upon a helper. This helps the patients to avoid muscular tightness, physical imbalance, disuse atrophy, etc.

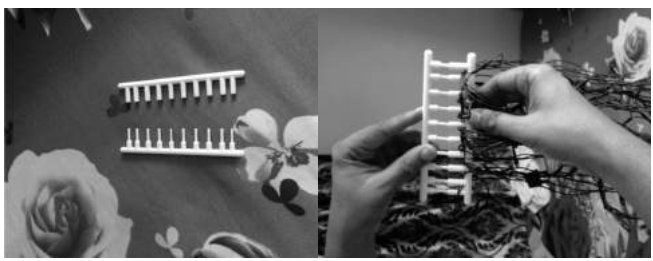
Arduous Therapist A Hand and A Wrist CPM

Innovation ID	Wesin wsha317
Innovation Title	**LIGHT LADDER-A simple multipurpose device that can solve problems like:- tangle diwali ..christmas lights, tangle ear phone wire, tangle t.v, dvd,etc, wire, can be use as shopping bag carrier**
Focus Area	Mechanical Engineering
Innovators	Shailendra Rakhecha

Lighting is interated part in society, in Diwali, Christmas or New year, we all put twinkle lights in as decorating our Home, offices, etc.

But there is a big problem before putting the lights, and thats it to untangle the twinkle light wire. Which take couple of minutes untangle and also some time while untangling if thw wire cut the entire wire is wasted.

Thats where our simple looking effective device can help. It is a ladder shape device which has interlocking facility in between rods , for easy open and close of the rods and the gaping of inbetween rods has also been designed and calculated in such a way that it can pack long wire.



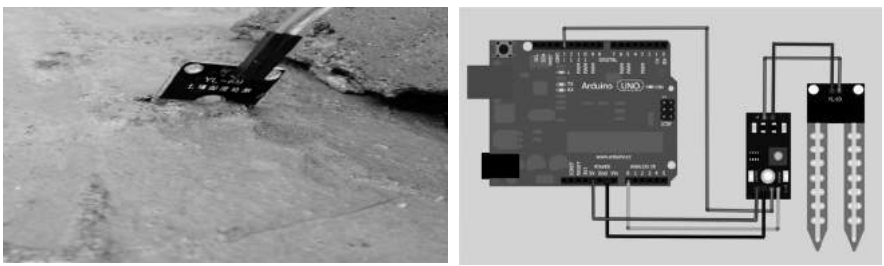
Light Ladder

what happen is we have to oepn the ladder in two parts and then out the wire in between the rods first and last rod gap is half cm so once the start and end part of wire goes it wont come out semilarly the in between wire goes in between rods , once all wire is pack The Interlocking part of ladser is put and its locked. Once locked it won't come out.

This device is a multipurpose device it can be used as tangled wire of t.v , dvds etc packers, shopping bag carrier, smaller version of light ladder can help pack tangled ear phone wire.

Innovation ID	TamTherT.J186
Innovation Title	**Smart Curing In Construction (Using Sensor)**
Focus Area	Civil Engineering
Innovators	T James Kevin Christy, R Mahesh, K Gokul Krishna

Curing is a process which protects the concrete from loss of moisture. Maintaining optimum moisture in the concrete can enhance the strength of concrete and also avoid the crack formation. In the conventional method curing is done manually which is a tedious and expensive process. In the present study, an attempt in lab scale level has been made to fully automised curing process using pumps and sensors. This process minimized the labor involved in the curing process. An optimum moisture level of 80% was achievable throughout the curing process. Curing is usually done in two major methods on site, splashing water on the concrete formation manually using hand held hose pipes or using some sort of textile cover that retains the water sprayed for a period of time, like a jute bag or hessian. These methods have their own disadvantages like they are expensive and use more quantity of water. This is where the idea of AUTOMATED CURING PROCESS is put to use. Spraying water on the concrete formation using water pump, sensors, micro-controller, thus making it a fully automated process.



Smart Curing In Construction

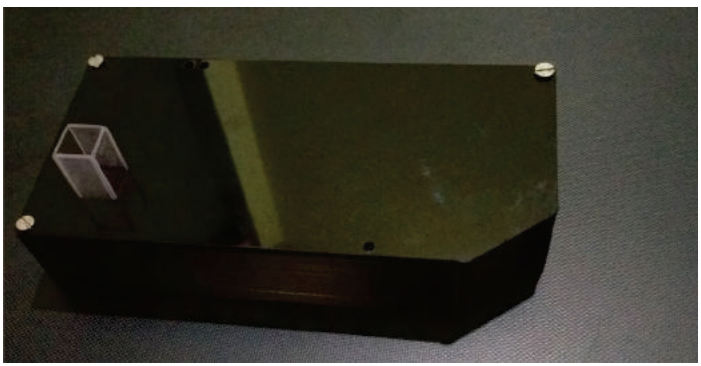
Innovation ID	JamNoneAnk268
Innovation Title	**Performance Insight 360: Quality Analytics Framework for Academia**
Focus Area	IT & ITes
Innovators	Ankur Gupta, Sahil Sawhney

Measuring, tracking and benchmarking institutional performance through business analytics has not been attempted in the Indian higher education space. The proposed invention is a first-of-its-kind quality analytics framework in academia called Performance Insight 360. Two patents have been filed on this invention which is a cloud-based analytics framework for higher education. Through the use of this framework, institutions are able to track performance of all stakeholders, boosting output, performance and achievement levels. The insights derived by this automated framework help institutions make informed decisions and design strategic interventions to improve overall quality. The fundamental problem therefore being addressed by the framework is "How to improve institutional quality?" and the operative keywords are quality, performance and achievement.

Innovation ID	UttMilkSHU89
Innovation Title	**Milktag: Inexpensive milk analyzer**
Focus Area	Bio Tech
Innovators	Shubham Rathore

India has 7.5 crore dairy farmers who sell milk at collection centers. Farmers are paid on the basis of milk fat and SNF which is tested by automatic machine or chemical method. Often farmers complaint about biased machines. Chemical method involves acid which results in skin and cloth burns. None of the exisiting solutions test adulteration. Report by FSSAI says that 67% of milk in India is adulterated which causes kidney and liver problems, and cancer in the extreme cases.

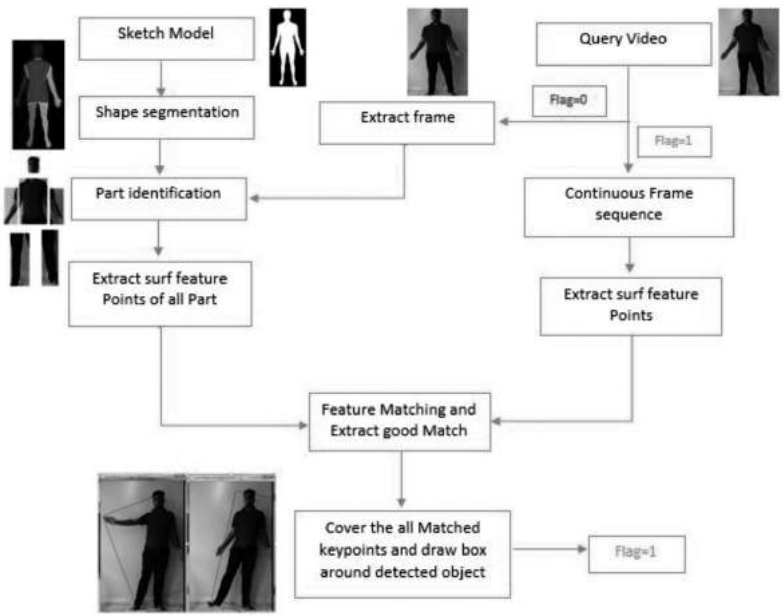
Milktag is a handheld milk analyzer based on indigeneously develped India's first compact spectrometer. It tells fat & SNF content and adulteration in 15 seconds. Milktag requires very less power and cost only Rs10k, thus forming an ideal solution for rural areas. It will encourage the local villagers to setup their own milk collection centers and empower them with better bargaining power, thus bypassing the middlemen, and increasing the rural income.



Milktag

Innovation ID	GujWe hchi198
Innovation Title	**Real Time Object Detection and Tracking using OpenCV**
Focus Area	IT & ITes
Innovators	Chirag N Paunwala, Heena Patel

Object detection is the very first step of the object tracking in real time application. The basic operation needed is the separation of the moving objects called "foreground" from the static information called the "background". There are some challenging situations in which this algorithm should perform very efficiently like



Real Time Object Detection and Tracking using OpenCV

Noisy image, Camera jitter, Illumination changes, Bootstrapping, Camouflage, Moved background objects, Inserted background objects, Dynamic backgrounds, Sleeping foreground object.

Object Tracking is the process of locating a moving object over time in each frame in real time. A tracking method typically consists of three components: object appearance model, motion model and search strategy. Major challenges include pose, appearance, scale changes, illumination variation, occlusion and clutter. The main benchmark for the tracking algorithm are accuracy and speed in each frame.

Our main goal of work is to find the best combination of detecting and tracking algorithm which will work as one algorithm and very efficiently in real time.

Innovation ID	GujStarJay94
Innovation Title	**Real DRASHTI-An Interactive System for Special People**
Focus Area	Electrical Engineering
Innovators	Jay Ashwinbhai Patel, Vipul Vinubhai Nathani, Viral Bankimbhai Thakar

There is a huge mass of deaf, dumb,blind & old age people, children, girls outside, still struggling for their independency from the help of other individuals in their daily life & "DRASHTI" is our effort to solve out some of them. It is specially designed for the school students, deaf & blind working people. It is merged of main six applications, in compact sized modules.

1. To alert a deaf person, walking/riding a vehicle in traffic, from a heavy vehicle behind him.
2. To notify about the emergency when a deaf person is in his closed room, working/sleeping.
3. A module by which Hoardings can be decoded for blind person.
4. Virtual Eyes for home.
5. An interactive GPS system which can narrate the path for the particular destination.
6. An emergency calling, texting system for deaf/mute person, children, older person or intellectually retired person who lacks the knowledge about the operating steps of cellular phones.

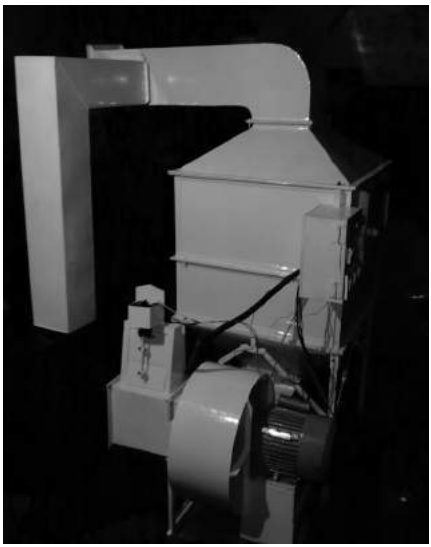
Real DRASHTI

Innovation ID	KerLocaPri134
Innovation Title	**Advanced Low Cost Spice Drying Machine**
Focus Area	Agriculture
Innovators	Prince Vincent, Nidhin Sunny

Our innovation is a fully automated low cost spice/agriproducts drier which runs on mainly temperature ,humidity and Pressure controls. The machine is an energy saver with various types of recirculation,heat transfer principles.It is used to dry variuos products like cardamom,ginger,rice,pepper,coconut,wheat,rubber products etc.

The machine helps farmers to reduce the initial investment,maximise their profit of final production by drastic reduction of running costs.The machine overcomes major issues like defores tation,pollution,unwanted labour etc. The machine increases the yeild of the product by giving better quality dried products.

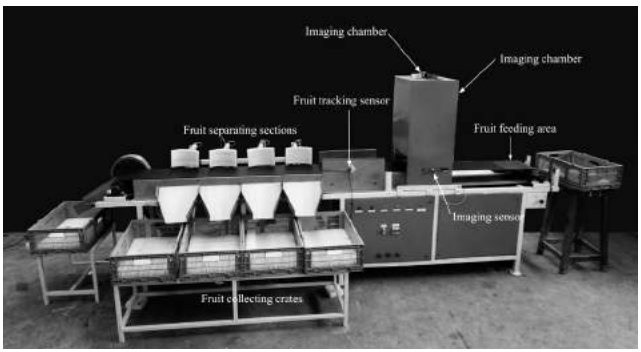
The machine is that helpful product in the present situation like low price of the agricultural products/spices,incresing need for environmental protection like Gadgil and Kasthoori Rangan reports and preventing poor farmers by not commiting suicide due to reduction in crop prices.



Advanced Low Cost Spice Drying Machine

Innovation ID	PunNilEya105
Innovation Title	**On-line grading system based on internal and external qualities of mango using machine vision technology**
Focus Area	Agriculture
Innovators	Eyarkai Nambi

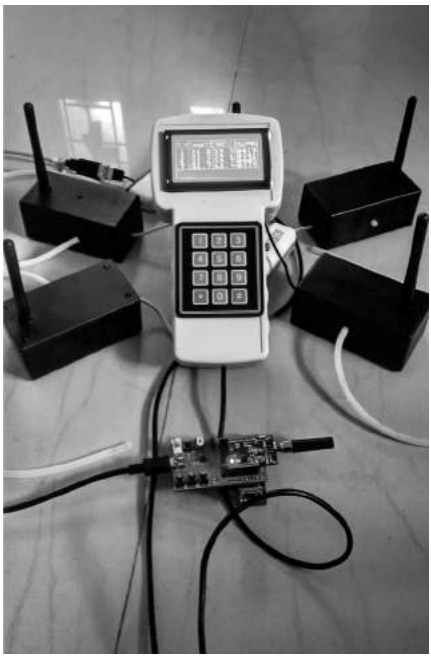
Mango is the major fruit crop of India and the country earns notable income valued to Rs.1000 corers in 2013-14. Quality inspection of mango during ripening and post-harvest processing is inevitable to get desire quality product for export. A machine was developed to grade the mangoes based on five ripeness level (unripe, early ripe, partially ripe, ripe and over ripe) and two sizes. The developed machine consisted of five sections viz. feeding, conveying, imaging, fruit separating and process controlling section. The machine works based on the principle of machine vision algorithm which was developed using various images features and fuzzy logics. The capacity of the machine was found as 620-650 fruits/h or 200-300 kg/h. The effectiveness of the machine was found as more than 98%. The cost of operation for machine was calculated as Rs.0.60/kg of fruits, compared to the cost of manual grading of Rs. 2.60/kg of fruits.



On-line grading system based on internal and external qualities of mango using machine vision technology

Innovation ID	TamhttpA B97
Innovation Title	**Wireless sensor nodes for monitoring quality of stored food grains in warehouse**
Focus Area	Agriculture
Innovators	A Balaji Ganesh

The condition of food grains stored in the warehouse environment was affected mainly due to physical changes in the environmental parameters, microbial infections and insect infestations. Food grain spoilage being an important social issue faced by every developing country, researchers has developed many methods to monitor and control the spillage in the storage area. Researchers have found various methodologies to analyze and detect the condition of these grains which were formerly inspected manually and proved to be inefficient and time consuming. The main setback of the available systems was that they need the manpower to monitor or control the food grains stored in the warehouse storage environment. Temperature, moisture content and relative humidity of the stored food grains are the most essential factors that support or influence the insect and microbial growth over the stored grains.



Wireless sensor nodes for monitoring quality of stored food grains in warehouse

Apart from the above factors various studies show that higher concentration levels of carbon-di-oxide is directly

correlated with the condition of the stored grain as well as the level of infections and infestations over the stored food grains. Hence the above environmental conditions of the storage space need to be monitored periodically to detect the spoilage of the food grains and setup of mold and other such insect colonies at its earliest stage to take the necessary measures.

Since wireless sensor networks have been introduced as a better tool suitable for a wide range of applications, it is well suited for monitoring the above environmental parameters in the warehouse environment to evaluate the condition of the stored food grains. The network of wireless sensor nodes which can be fixed or mobile within a limited geographic structure, shares the essential sensor data to evaluate the condition of the environment faces various challenges like cost, power consumption and area of coverage, size and connectivity. The design and development of such a low cost ultra low power wireless sensor node with various optimizing algorithms suitable for food grain spoilage monitoring and many other useful applications, energy efficient smart building, green house monitoring and environmental air pollution monitoring are reported here.

Innovation ID	MahThe Ari40
Innovation Title	**India'a Most Energy Efficient BLDC Based Ceiling Fan**
Focus Area	Energy
Innovators	Arindam Paul

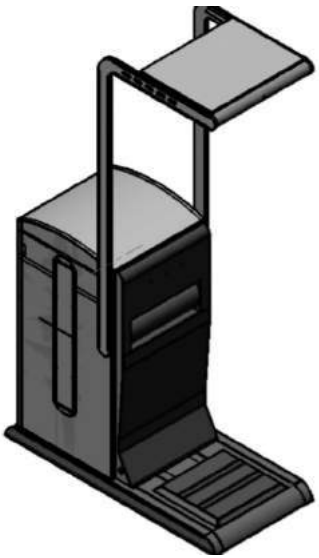
A super-efficient BLDC motor based ceiling fan is designed which consumes very less energy and runs almost silently. Running on less than 28 watts, it consumes only 1/3rd power when compared with any conventional AC induction motor ceiling fan. This also makes it highest service value (air delivery per watt consumed) fan in India. A 10 button remote is provided along with fan to control five speed levels, timer and sleep mode.

BLDC stands for Brushless Direct Current, it has no mechanical brush for commutation of the windings. Commutation is deployed by help of smart electronics which is responsible for sensing the magnet rotor position with respect to stator and controls the motor driving switches. Winding magnetic field react with field of permanent magnets on the rotor to develop the required torque. Any friction, associated power loss, spark and electrical noise is completely eliminated in brushless commutation as no slip ring or mechanical brushes are used. Electronic commutations enable better flexibility over controlling motor speed. It is a sensor less design, electronics measures Back EMF induced in the windings to sense the rotor position precisely. Hence eliminating need of Hall Effect sensors which are prone to fail in harsh environment hence making overall motor less reliable. Motor design is optimized at mechanical and electronic end to minimize the losses occur in heating. This is achieved by smart motor tuning algorithm, optimized motor design and material selection to reduce eddy current losses and copper losses inside the motor.

India'a Most Energy Efficient BLDC Based Ceiling Fan

Innovation ID	DelTherNar829
Innovation Title	**Maclec Advance Swaccha-Bharat Trash (Mast) Waste Compaction Machine**
Focus Area	Energy
Innovators	Narayan Bhardwaj

It's an initiative to address much needed transformation of municipal solid waste collection methodology from conventional dustbin to next generation waste compression cum primary treatment facility equipped solar powered smart garbage collection System. M.A.S.T. not only compress the collected garbage to enhance capacity of garbage box, but also treated the collected waste regularly using non xenobiotic organic chemicals which inhibit microbial activity in collected garbage thereby minimizing risk of spreading transmissible pathogens also promoting hygienic waste collection. The solely indigenous patented system is equipped with automations such as garbage level sensor, automated compression control unit, GSM based SMS alert system, Fire protection system, etc. To encourage citizens especially from developing countries, System is equipped with BMI system which display BMI of each user and update them about their health. To generate revenue, M.A.S.T. offers up-to 30 Square feet surface area for LED based sign boards along with audio/ projector video system for advertisement and public addressing.



Maclec Advance Swaccha-Bharat Trash (Mast) Waste Compaction Machine

Confederation of Indian Industry

Department of Science and Technology
Government of India

All India Council for Technical Education

Young Indians
WE CAN | WE WILL

India Innovation Initiative

Opportunity to harness innovations for wealth generation and societal benefit

8TH INDIA INNOVATION INITIATIVE 2016

Partners

Knowledge Partner

Co-Promoters

Institutional Partners

Knowledge Partner

Indian National Academy of Engineering (INAE)

The Indian National Academy of Engineering (INAE), founded in 1987 is an autonomous institution supported partly through grant-in-aid by Department of Science & Technology, Government of India. It comprises India's most distinguished Engineers, Engineer-scientists and Technologists covering the entire spectrum of engineering disciplines.

INAE functions as an apex body and promotes the practice of engineering & technology and the related sciences for their application to solving problems of national importance. The Academy provides a forum for futuristic planning for country's development requiring engineering and technological inputs and brings together specialists from such fields as may be necessary for comprehensive solutions to the needs of the country. INAE has been steered by many eminent Fellows like late Dr. APJ Abdul Kalam, former, President of India; Dr. Anil Kakodkar, formerly Chairman, Atomic Energy Commission and Dr. K Kasturirangan, formerly Chairman, Space Commission. Dr BN Suresh, Honorary Distinguished Professor, ISRO and Formerly Director, VSSC, Trivandrum is the current President of INAE. Presently INAE has 762 Fellows from India and 69 Foreign Fellows on its rolls identified in ten Engineering Sections.

As the only engineering Academy of the country, INAE represents India at the International Council of Academies of Engineering and Technological Sciences (CAETS); which is an independent non-governmental international organization comprising of Member Academies from 26 countries from the world over and is committed to enhancing the contribution of science, technology and engineering in the world.

Some of the various activities of the Academy are highlighted below. The Academy organizes Symposia/Seminars/Workshop/Conferences at national/ international levels on topics of national importance. The Engineers Conclave and the National Frontiers of Engineering Symposium are held each year. The Engineers Conclave, an annual mega event of engineers is being organized jointly with major engineering institutions, on rotation basis with the objective

of providing a platform for engineers from allied fields to meet, deliberate and recommend right engineering solutions to some of the pertinent issues of national importance. The National Frontiers of Engineering Symposium is an annual event which brings together outstanding young engineers from companies, universities, and government labs to discuss leading-edge research and technical work across a range of engineering fields.

One of the other important objectives of the Academy is to assist the Government from time to time in formulating policies on critical technical issues. For this purpose, four forums have been constituted – INAE Forum on Engineering Education, INAE Forum on Energy, INAE Forum on Technology, Foresight and Management and INAE Forum on Engineering Interventions for Disaster Mitigation. With these activities and many more, the Academy endeavours to enhance its outreach in the engineering domain.

Website: http://inae.in/

Indian Angel Network

Indian Angel Network is India's first and now the world's largest Angel Investor Group, brings together successful entrepreneurs and CEOs who share a passion to enable more early stage businesses to create scale and value. By focusing on startups, the Network addresses the current acute lack of funds available to early stage companies. The Network believes that early stage businesses require more than just money to succeed. They require close mentoring and inputs on strategy as well as execution.

Indian Angel Network currently has close to 400 members drawn from across the country and some from overseas, including leading lights from diverse sectors. Co founded by leaders like Saurabh Srivastava, Raman Roy, members now include people like Kris Gopalakrishnan, Pramod Bhasin, Jerry Rao, Sanjeev Bikchandani, Ajai Chowdhry, Rajiv Luthra, Sunil Munjal amongst many others. Institutions such as SIDBI, Helion, Sequoia Capital, IDG, IBM, Michelin, etc. are actively engaged with the platform

IAN's operations are spread across 6 cities in India (Delhi, Bangalore, Mumbai, Pune, Hyderabad and Kolkata) with regular pitch sessions. IAN was launched by Prime Minister Cameron in the presence of 4 of his senior Cabinet colleagues from No 10 Downing Street. This makes IAN the world's first angel group to set up operations outside of its home country. It now has regular pitch sessions in London as well bringing innovative British ventures to not only raise funds at IAN but also leverage the large global market access that IAN provides to build global foot print companies. Several innovative British companies have now joined the IAN portfolio and are rapidly scaling up across borders including India, Singapore, US, etc.

Close to 5,000 entrepreneurs reach out to IAN and undergo a quick but deep multi layered diligence process. This results more than 300 shortlisted ventures presenting to IAN investors annually through weekly pitch sessions. This diligence / curation ensures that investment opportunities finally presented to investors raise about $500K in less than a day! Interestingly IAN does not stop at just

helping companies raise monies – the engagement goes well beyond. Companies are not only mentored by investors, but IAN supports them to access global markets / clients, build their teams, help build their visibility / brand, raise next round investments, etc. This post investment support and engagement helps the companies to grow their businesses faster and build globally competitive companies

With a portfolio of over 80 companies invested across multiple geographies (7 countries) and multiple sectors (17 sectors), the Network has met with early successes. Some of its marquee investee companies have given investors outstanding returns with a potential to become unicorns - WebEngage with close to 6x returns in 18 months, Druva with 290x over 81 months, Stayzilla with 18x over 31 months, Box8 with 20x over 30 months, Sapience with 18x in 51 months, Consure with 10x over 42 months, Traffline with 13.5x in 43 months, etc. It has built excellent relationships with main stream VCs (like Sequoia, Nexus, Matrix Partners, Tenaya, IDG, Kalaari, USF, Inventus,etc) which have invested in its portfolio companies.

Website: www.indianangelnetwork.com

The Indus Entrepreneurs (TiE), Delhi-NCR

The Indus Entrepreneurs (TiE), was founded in 1992 in Silicon Valley by a group of successful entrepreneurs, corporate executives, and senior professionals with roots in the Indus region. There are currently 13,000 members, including over 2,500 charter members in 61 chapters across 18 countries. TiE's mission is to foster entrepreneurship globally through mentoring, networking, education, incubating, and funding. Dedicated to the virtuous cycle of wealth creation and giving back to the community, TiE's focus is on generating and nurturing our next generation of entrepreneurs.

Website: http://delhi.tie.org/

The Startup Board (TSB)

World over, the vacuum of continuous mentoring is acutely felt by the start-ups. These founders could be fresh college pass-out, professionals starting their second innings, companies looking at growth stage, women or rural entrepreneurs.

The Startup Board (TSB) is a group of experienced industry professionals who work with the start-up founders, to help increase the chances of success of the business venture. Under our flagship Able2Enable program, mentors, with their perspective and experience, work together to overcome the pain-points that founders have. These could range from to work on growth of top-line, increasing reach of products / services in new geographic areas, increasing brand presence, helping with key management recruit during growth or alike. The engagement is result driven.

The Startup Board brings together "The Right team" which is the key to the success of start-up venture. The mentoring is based on practical tips and leverages the contacts and know-how of the working professionals.

Team for a venture is modular in structure and is constituted as per the need. It may include core team that comprises of experts from major functional areas - strategy, human resources, sales and marketing, finance or technology. Another layer could consist of guidance from support groups on Government policies, IP & trademarks, processes, partnerships, among others. On top of it, macro sector specific trends are sourced from the domain experts. Professionals are chosen based on their entrepreneurial bent of mind, expertise in their functional area, and minimum 10 years of industry experience to ensure availability of rich blend of perspective.

Big organizations have their board of directors who guide the CEO / management team on strategic direction, TSB fills this gap for the start-ups.

Website: www.thestartupboard.com.

Forum for Industry Interaction (FII), Indian Institute of Management, Ahmedabad

FII is ISO 9001:2008 certified and is India's largest student consulting body (as recognized by the Economic Times). Under the aegis of FII, students of the Indian Institute of Management, Ahmedabad organise themselves in teams of 5 to consult companies in their live projects for a period of 16 weeks. These students are supported with the expertise the IIMA faculty and the executive MBA students in this endeavor. In the academic year 2015-16, FII launched 88 projects covering various domains like finance, marketing, public policy, strategy etc. Throughout the years, FII's portfolio has included established businesses like Amazon, GE, Saint Gobain, Cisco, Adani Group as well as startups/SMEs and some Government projects.

To take the industry-student interaction at a further level, FII has formulated affiliations through corporate alliances, conferences, and business events. Last year, FII has partnered with Confederation of Indian Industry (CII), Federation of Indian Chambers of Commerce (FICCI), The Indus Entrepreneurs (TiE) and Centre for Innovation, Incubation & Entrepreneurship (CIIE) at the National level. In an effort to establish a global footprint, FII has also created alliances with the different student and corporate bodies across the globe, namely, European Confederation of Junior Enterprises (JADE), Business Club India-France (BCIF), Brasil Junior and McCombs School of Business, University of Texas. Through these networks, FII facilitated IIM Ahmedabad student participation in more than 14 national and international conferences.

Website: http://www.iimafii.org/

A.T. Kearney

A.T. Kearney is a leading global management consulting firm with offices in more than 40 countries. Since 1926, we have been trusted advisors to the world's foremost organizations. A.T. Kearney is a partner-owned firm, committed to helping clients achieve immediate impact and growing advantage on their most mission-critical issues. Our clients are large private and public-sector organizations.

We are 3,700 people strong worldwide, who have broad industry experience and come from leading business schools. We staff client teams with the best skills for each project across A.T. Kearney.

We have a distinctive, collegial culture that transcends organizational and geographical boundaries. It is not just what we do, but how we do it. Our consultants are down-to-earth, approachable and have a passion for doing innovative, great work. We pride ourselves to be collaborative, authentic and forward-thinking.

In India, A.T. Kearney has been serving clients for over 30 years, and we opened offices in New Delhi in 1997 and subsequently Mumbai in 2004. Both offices have grown rapidly and are outstanding examples of the firm's growth story in India. Today, the Indian office has close to 200 consultants.

On the innovation side, A.T. Kearney has been focusing on innovation for more than a decade, and we are committed to helping companies and nations raise their game. We are particularly proud to be, together with CII, knowledge partner of the Global Innovation Index (GII), through our non-profit subsidiary IMP^{3}rove, the European Innovation Management Academy. The IMP^{3}rove Academy is the result of over 10 years of work with the European Commission and offers innovation management support services to both the public and the private sector and has assessed the innovation capabilities of over 5,000 companies.

We are delighted to be a knowledge partner to CII's innovation initiative and the exciting i3 program.

Website: https://www.atkearney.in/

Department of Science and Technology
Government of India

Department of Science and Technology (DST), Government of India

The Department of Science and Technology (DST), Government of India was established on the 3rd of May 1971 following the success of Green revolution that signified innovative deployment of scientific methodologies. . Over the last forty three years, DST developed several streams that later established themselves as departments or even ministries with focused goals. Some of these include the Department of Biotechnology (DBT), Department of Scientific and Industrial Research (DSIR), Ministry of Environment & Forests (MoEF), Ministry of New & Renewable Energy (MNRE), Department of Electronics (DoE) and Ministry of Earth Sciences (MoES). The DST serves as a nodal agency connecting the science sector to the Government verticals. The roles played by DST are varied and these evolved with time. DST is accordingly (a) Develops S&T policies, (b) Strengthens human resources and institutional capacities, (c) Enables development & deployment of technologies, (d) Creates opportunities for societal interventions through S & T & (e) Establishes and engages in mechanisms of cooperation, partnerships & alliances. These approaches that reflect its mission ensure a holistic systemic influence, immediate, medium and long term relevance/ gains. It enables cross cutting impacts across sectors to sustain growth/ development and synergies to optimize on time, human, institutional and financial resources.

The DST has consistently enabled transformational changes through appropriate responses and often non-participative roles. DST accordingly played the role of an extra mural research funding agency wherein competitive grants for research was provided to investigators based on technical merit. This system was in vogue for nearly three decades. DST also took cognizance of several changes in approaches around the world, over the years and evolved its own systems adapted to India's needs. This resulted in some directional changes that evolved into proactive functions and participative actions. These are evident in DST's robust

facets including proactive identification of gap areas and development of new programmes and schemes, evidence based approaches to define gaps / needs balancing competitive and development models, championing for larger resource allocations for science, expansion of stakeholder variety and base, interactions centered on value of stakeholder engagement, internal connectivity of various programmes, effective planning and coordination to optimize use and delivery of resources, gain a deeper understanding of local needs and establish a dynamic balance among three basic priorities of an integrated vision to synthesize equity, expansion and excellence in the science sector.

DST ensures a synthesis of the outcome of policies, plans, programmes and projects through appropriate forward and backward linkages. International S&T cooperation with friendly countries had become a national priority and DST was assigned the task. Thus, DST establishes strategically important systems / mechanisms to stimulate and foster excellence and leadership in scientific research and development. These are aligned with India's developmental aspirations and will further help consolidate the niche it has established in several frontiers at the national, regional and global levels.

Department of Science & Technology,
Technology Bhavan, New Mehrauli Road,,
New Delhi-110 016.

Website: http://www.dst.gov.in/
Email: dstinfo@nic.in

All India Council for Technical Education

All India Council for Technical Education

The AICTE was constituted in 1945 as an advisory body in all matters relating to technical education. Even though it had no statutory powers, it played a very important role in the development of technical education in the country. It had four regional committees with offices at Chennai, Mumbai, Kanpur and Calcutta. All the new schemes and proposals for starting new institutions/Programmes were approved by the corresponding Regional Committee and subsequently vetted by the Council.

Having vested with Statutory powers, AICTE has initiated necessary steps for planning, formulation and maintenance of norms and standards, accreditation, funding of priority areas, monitoring and evaluation of courses/programmes in the field of technical education to ensure coordinated and integrated development of technical education in the Country. In order to achieve the planned growth and to nurture quality in technical education system, AICTE has spared no effort to inculcate competitiveness to face the globalization and in generating competence and quality in technically qualified human resources to make it globally acceptable.

Mission

- A true facilitator and an objective regulator
- Transparent governance and accountable approach towards the society.
- Planned and coordinated development of Technical Education in the Country by ensuring world-class standards of Institutions through accreditation.
- Facilitating world-class Technical Education

Vision

"To be a world class organization leading technological and socioeconomic development of the Country by enhancing the global competitiveness of technical manpower and by ensuring high quality technical education to all sections of the society."

Objectives

- Promotion of Quality in Technical Education.
- Planning and Co-ordinated Development of Technical Education System.
- Regulations and maintenance of Norms and Standards.

All India Council For Technical Education
Nelson Mandela Marg
Vasant Kunj, New Delhi-110067
Website: http://www.aicte-india.org/

Young Indians (YI)

Young Indians (Yi) is an integral part of the Confederation of Indian Industry (CII), a non-government, not-for-profit, industry led and industry managed organisation playing a proactive role in India's development process. Yi was formed in the year 2002 with an objective of creating a platform for young Indians to realize the dream of a developed nation. Yi has around 2350 direct members in 40 chapters, and engages around 10500 students through chaupals, under the brand 'Yuva'. The Yi membership includes young progressive Indians between the age group of 21 & 40 and comprises entrepreneurs, professionals and achievers from different walks of life. "To become the Voice of Young Indians Globally" being the vision of Yi, it provides a platform for young Indians to participate in and contribute by becoming an integral part of the Indian growth story. Yi's work is divided primarily into three groups; "Youth Leadership", "Nation Building" and "Thought Leadership".

Under youth leadership, Yi works effectively for promoting leadership skills for its members through the learning programs and missions to companies of global excellence in India and abroad; the development and engagement of students through its 109 Chaupal platforms that has 10500 students; Yi's regional and national summits on themes related to times and role of youth and its engagement with the governments at the state and national level gives an opportunity for the members to become effective leaders with a vision into the future. Yi recently hosted Jeff Hoffman, serial entrepreneur from the United States across the country and hosted his renowned 'Entrepreneur Bootcamps' for its camps.

Under Nation Building, Yi engages its members under the board categories of education, environment, healthcare, employability, arts (sports & culture) and rural initiatives contributing positively to its surrounding eco system and the nation.

Through its initiatives like Akshara under Education, Yi has impacted more than 15000 students across 57 centers and has successfully managed campaigns like the 'SYightboard Project', providing blackboards to schools across different cities, reaching out to 1070 schools nationally and impacting approximately 2,53,000 children. The Green I Contest done with an objective to engage school children to become socially aware and responsible citizens is one of its flagship programs, with the winner getting a grant of Rs 7.5 lakhs to implement their ideas.

Under "International Engagements", Yi is one of the proud founders of the G20 Young Entrepreneurs' Alliance which is a collective of leading entrepreneurially-minded organizations representing the G20 countries who seek to promote youth entrepreneurship as a powerful driver of economic renewal, job creation, innovation and social and is one of the founders of the Commonwealth Alliance of Young Entrepreneurs (CAYE- A) which is a network of young entrepreneurs from the Commonwealth Asia region and the organizations that support them. Yi has organized learning missions to many countries around the world to understand and learn from the best practices and cultures. It has also worked with the Planning Commission of India in conducting consultation workshops across its chapters for accumulating a youth perspective to be included in the 12th Five Year Plan and with the Ministry of External Affairs, Government of India to facilitate missions of visiting delegations of young entrepreneurs to India from around the world. Yi has also hosted many incoming youth delegations from around the world in various parts of the country.

With Thirteen years of glorious past and decades ahead that promise nothing short, Yi intends to become a larger movement of young people and promote the attitude of "We Can, We Will"

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Confederation of Indian Industry

The Confederation of Indian Industry (CII) works to create and sustain an environment conducive to the development of India, partnering industry, Government, and civil society, through advisory and consultative processes.

CII is a non-government, not-for-profit, industry-led and industry-managed organization, playing a proactive role in India's development process. Founded in 1895, India's premier business association has over 8000 members, from the private as well as public sectors, including SMEs and MNCs, and an indirect membership of over 200,000 enterprises from around 240 national and regional sectoral industry bodies.

CII charts change by working closely with Government on policy issues, interfacing with thought leaders, and enhancing efficiency, competitiveness and business opportunities for industry through a range of specialized services and strategic global linkages. It also provides a platform for consensus-building and networking on key issues.

Extending its agenda beyond business, CII assists industry to identify and execute corporate citizenship programmes. Partnerships with civil society organizations carry forward corporate initiatives for integrated and inclusive development across diverse domains including affirmative action, healthcare, education, livelihood, diversity management, skill development, empowerment of women, and water, to name a few.

The CII theme for 2016-17, **Building National Competitiveness**, emphasizes Industry's role in partnering Government to accelerate competitiveness across sectors, with sustained global competitiveness as the goal. The focus is on six key enablers: Human Development; Corporate Integrity and Good Citizenship; Ease of Doing Business; Innovation and Technical Capability; Sustainability; and Integration with the World.

With 66 offices, including 9 Centres of Excellence, in India, and 9 overseas offices in Australia, Bahrain, China, Egypt, France, Germany, Singapore, UK, and USA, as well as institutional partnerships with 320 counterpart organizations in 106 countries, CII serves as a reference point for Indian industry and the international business community.

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