Confederation of Indian Industry

Department of Science & Technology
Government of India

All India Council for
Technical Education

India Innovation Initiative

Five Years of India Innovation Initiative

A Report - 2015

CII-i3 Innovation Challenge

An opportunity to harness innovations for wealth generation and societal benefit

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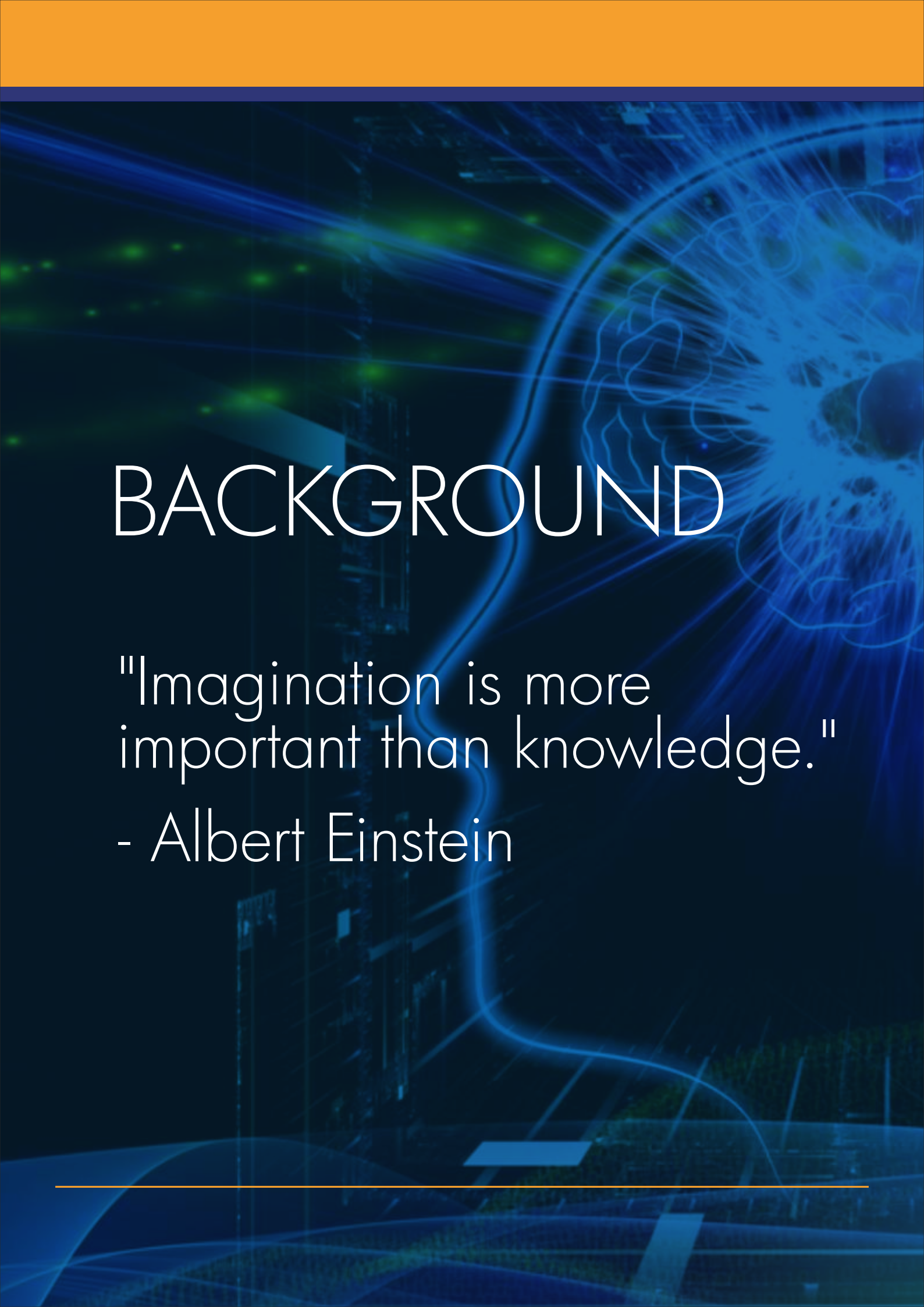


BACKGROUND

"Imagination is more important than knowledge."

- Albert Einstein

Imagination is the backbone of any strong idea and this idea can lead an individual or a group or a community or even a nation to great heights in terms of impact and reach; however this must be coupled with the right conviction and stable support mechanisms. The technology boom of the 21st century is one such example. Various government, private and not for profit organizations have intensified dedicated efforts to encourage innovation and entrepreneurship across all sectors. This is done with the view to solve societal problems, secure economic gains and generate employment.

This report describes one such program supporting innovation; the India Innovation Initiative (I3) 2015 - a joint initiative of Catalysed and supported by the National Council for Science and Technology Communication (NCSTC) under the Ministry of Science and Technology, the All India Council for Technical Education (AICTE) and the Confederation of Indian Industry (CII). The overall objective of this report is to describe the scope and extent of innovation as well as initiatives which promote innovation in a developing, knowledge-based economy such as India.

About the Report

This report is divided into following sections.

Section A: *explains the philosophy and rationale behind innovation, the motivation and need to innovate, India's relative standing in the field of innovation and detailing the obstacles to innovation with possible solutions.*

Section B: *describes the prevailing government and private sector initiatives to promote innovation in the country with a special emphasis on the business incubator scenario in the country – a critical component to promote innovation in the country.*

Section C: *traces the I3 journey since its inception in 2010 – the challenges it has faced and its accomplishments. It examines how the initiative has evolved over the years and looks at the brief profiles of some of the past winners and their achievements post their victory in this competition.*

Section D: *offers an overview of India Innovation Initiative (i3) 2015. It gives the details of the selection process, focus areas and the professional background of participants.*

Section E: *is an in-depth evaluation of the projects shortlisted for the final round of the competition this year. These projects have been evaluated on the basis of six key parameters namely; understanding of the problem at hand, creativity and innovation, implementation strategy and plan, relevance, results and conclusions drawn and presentation of the report.*

Section F: *provides a brief profile and description of all the jury members who have participated in this challenge at different levels.*

Foreword

Prof. Anil Dattatraya Sahasrabudhe
Chairman
All India Council for Technical Education

A robust innovation ecosystem nourished by a large, high quality and enabling education system determines the growth of a nation. The state of a country's innovation landscape is an index to its ability to solve its myriad challenges – economic, social and political. This is especially true for developing nations with a high demographic dividend such as India, which has a large untapped human resource in the form of over half of its population below the age of 35. This makes it all the more crucial that solutions to critical problems come from among the people themselves.

The Global Innovation Index ranks India at 81 out of 141 countries. India is rated low on innovation index year after year and we need to urgently reverse this trend by both increasing R&D budgets and developing a facilitating environment for innovation. With the annual R&D spending at 0.8% of GDP (2014), the Indian innovation landscape is characterized by low investment and low density. Three-fourths of the Gross Expenditure for R&D (GERD) comes from the government, a mere 20-25% from the private sector and 5% from the universities, which makes India a fringe player in the global Science, Technology and Innovation landscape.

Mere support to the cause of R&D is not enough, a dynamic innovation ecosystem can be seen as an alloy of the right policies to actively nurture it, a vibrant and constantly evolving higher education system that spawns a whole new breed of scientists and innovators and an industry that wholeheartedly participates in it through direct R&D funding, setting up of research-intensive small and medium businesses and encouraging a culture of innovation for solving business and social challenges.

The All India Council for Technical Education (AICTE) with its mandate to enhance global competitiveness of technical manpower by ensuring high quality technical education to all sections of the society works to gear the whole academic machinery towards increasing industry-institute interaction for new products, services and patents, inculcating an entrepreneurial spirit and encouraging indigenous innovation.

Innovation is an important driver of economic progress and social equity in any economy across the development spectrum. It has come to be more broadly defined and measured by going beyond the conventional parameter of R&D laboratories and citations in scientific journals and has also brought within its fray business and social innovations especially at the grassroots level.

The India Innovation Initiative, a joint-project of the Department of Science & Technology (DST), Confederation of Indian Industry (CII) and AICTE, is a unique and promising initiative in this direction. Over the last five years it has become a well-known and highly anticipated annual competition for innovators across diverse educational, professional and cultural backgrounds in the country. Having completed seven years, i3 has consistently grown in both in scale and impact.

I congratulate CII on the release of the first report "Five Years of India Innovation Initiative" as it works hand-in-hand with the government, academia, industry and innovators to contribute to a knowledge-based economy.

Foreword

Dr. B.P. Singh
Scientist G & Head (NCSTC)

The National Council for Science & Technology Communication is an apex organization with the mandate of science communication and popularization among masses. It is devoted to create scientific awareness among varied target groups through innovative scientific ideas, adoption of latest technologies to enable informed decision making.

The council has been supporting India Innovation Initiative (I3) to encourage students, entrepreneurs and others, towards new thinking and development of innovative tools to make our daily life, easy. The council has been undertaking, this initiative since 2010, in collaboration of Confederation of India Industries (CII) and All India Council for Technical education (AIICTE). Many success stories have emerged out through such initiatives which were awarded and encouraged for innovation incubation. This year participation was invited for I3 2015 in the fields of engineering, ICT, healthcare, life sciences, agriculture, energy, etc. More than 700 innovators applied under various categories and a jury of experts from academia and industry has short listed many note worthy innovations. The shortlisted innovators will be awarded and provided mentoring support.

I wish India Innovation Initiative challenge 2015 all the success.

Foreword

Chandrajit Banerjee
Director General
Confederation of Indian Industry

The Confederation of Indian Industry (CII) is committed to deepening its active engagement in creating and driving a culture of innovation and start-up ecosystem and support novel and enterprising problem-solving inventions and ventures. CII works dedicatedly in synergy with the government, industry and academic institutions to strengthen the innovation environment in the country and make it more grassroots friendly. The 7th India Innovation Initiative 2015 was a year-long exercise towards this direction with an unflinching faith in the India Innovation Story.

The first report on the five-year long journey of India Innovation Initiative (i3) documents the opportunity which is available to harness innovations for wealth generation and societal benefit. This initiative provides a unique national platform for promoting innovation and entrepreneurship in the country.

The report captures the spirit of innovation and the entrepreneurial ecosystem of our nation through the five-year journey of i3, since 2010. It gives a macro view of the innovation sphere and tries to address questions such as what is the nature and scope of innovation in India; to what extent is innovation in the form of solutions to industry and social challenges coming from the grassroots; what are the trends and possibilities; what kind of institutional support does the common man with entrepreneurial aspirations have to make his dreams a reality. It also highlights the strengths, weaknesses, opportunities and challenges of the innovation environment through case studies of some of the success stories which have emanated from this competition.

I would like to thank the National Council for Science and Technology Communication (NCSTC), Department of Science and Technology and the All India Council for Technical Education (AICTE) - co-promoters of i3 - for their continued support in making this initiative a great success.

2. INNOVATION – AN ANTIDOTE TO STAGNATION

2.1 Understanding Innovation

Defining Innovation

There are varying degrees to which one can define innovation. Over the years we have seen eminent personalities of global organizations define innovation. In simple terms, innovation is understood as a new idea or effective device and process. It is viewed as the application of better solutions that meet new requirements, unstated or existing market needs. Listed below are some interesting definitions of 'innovation' that readers should keep in mind while understanding the multiple layers and intricacies involved in innovation:

The **European Union**[1] interprets innovation "as change that speeds up and improves the way we conceive, develop, produce and access new products, industrial processes and services. Changes that create more jobs, improve people's lives and build greener and better societies are classified as innovation."

Princeton University defines innovation *"as the application of new ideas to products, processes or other aspects of the activities of a firm that lead to increased 'value'".*

Organization for Economic Cooperation and Development (OECD)[2] sees innovation *"as the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organization method in business practices, workplace organizations or external relations."*

The Bloomberg Company[3] interprets innovation as *'the creation of products and services that make life better, an antidote to stagnation'.*

A more theoretical definition of innovation was coined by Austrian economist **Joseph Schumpeter**[4] as *"a process of industrial mutation that incessantly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one."*

Clayton Christensen[5]**,** Professor of Business Administration at **Harvard Business School** goes a step further to describe *"'disruptive' innovation as a process by which a product or service takes root in simple applications at the bottom of a market and then relentlessly moves up the market, eventually displacing established competitors."*

Innovation vs. Creativity and Invention

In popular parlance, 'innovation' is often used interchangeably with creativity and invention. Though similar in nature, these concepts vary greatly in application. While creativity is a subjective, intangible ability to generate ideas or products that are both novel and appropriate to circumstances, innovation is about introducing tangible, measurable changes into existing stable systems. Invention, on the other hand is the creation or introduction of a product or service into the market for the first time.

While comparing the differences between innovation and invention, it is important to note that unlike invention, innovation does not happen accidentally but is the result of planned efforts and can happen only under certain influencing cultural conditions. In that sense innovation is more akin to discovery, of a new way of handling a problem.

For example; the Apple iPod wasn't the first portable music player, instead it was the walkman, invented by the Sony Corporation. What distinguished the iPod from other music playing portable devices and made it synonymous with innovation in the digital world was the fact that it was a combination of excellent ergonomics, ease of use and design in a single device. The Boeing Company is another such example. While De Havilland - a British company created the world's first passenger jet plane, the industry continues to be dominated by Boeing. As stated by **Jim Moffat**[6]**,** Chairman and CEO of Deloitte Consulting as his

[1]Source: European Union Press Release database
[2]Source: Oslo Manual – Guidelines for collecting and interpreting innovation data, OECD
[3]Source: Bloomberg Innovation Index
[4]Source: Theory of Economic Development, Joseph Schumpeter
[5]Source: Clayton Christensen official website

understanding of innovation; 'innovation is a combination of things. It's part ideation and it's part creativity... it's part business and part process. It's a culmination of things, a combination of skills and attributes more than it is a specific definition.'

Innovation – Consensus on Key Characteristics

While we are yet to come up with a universally binding definition for innovation, a consistent theme across definitions is an element of **'novelty'**, that innovation is something different, unique or improved that creates value. The 'something' in this context can be anything – a process, product or service, and may start as smart ideas or thoughts; or as innovative thinking.

Peter Drucker[7], the Austrian economist and management consultant has given a pragmatic explanation of innovation. He talks about innovation as 'whatever changes the wealth producing potential of already existing resources; an innovation is much more than technological advancement, with an effect on the economy and society'. According to Drucker, the best innovations can be alarmingly simple, and often have little to do with technology or inventions. For instance, the invention of the metal container that could be easily offloaded from a truck to a ship did not entail any remarkable technological discovery. However, it was the advent of container shipping as a standardized system of moving things around the globe that the innovation quadrupled world trade.

This view of Drucker is supported by **The Economist Group**[8] which explains innovation "as novelty in processes or ideas, although it may involve an existing idea from another industry or country." The Economist Group further explains that innovation does not require new or existing technology. As seen in the case of McDonald's, a different way of running or managing a restaurant and servicing customers need not be preceded by a technological breakthrough. In this way, we can infer that innovation is not only new technology but also the novel application of different processes.

The second key characteristic of innovation is **'value creation'**. This characteristic defines innovation in terms of the value created or captured by it – a significant positive outcome. This may be in the form of business/ enterprise value or competitive advantage or access to new markets/ customers and social value or process that solves social challenges in new ways. Many of the greatest innovations involve some kind of social value creation such as insurance or the modern hospital or the textbook.

Finally, the innovation must have potential for **large scale adoption** and should be **applicable and sustainable** across **different demographics and cultures.** Also, it should be compatible with the exact needs of its prospective beneficiaries. For example, the ICT revolution in India was an inclusive, large scale innovation, applicable across a variety of sectors.

To sum up, any product, idea or approach which is new to its context of application adds value and can be adopted on a large scale thereby qualifies as innovation.

2.2 Link Between Innovation and Economic Growth

nnovation[9], as the implementation of a new or significantly improved product (good or service), or process, a new or organizational method in business practices and external relations play a decisive role for economic development. Substantial literature on the world history of innovation attributes the breakthrough economic progress of Western societies to a transition from labour to innovation led growth. Innovative activity has become such an integral part of economic growth that many theories on economics of innovation have been established.

The earliest piece of economic literature identifying the link between economic progress and innovation was The Theory of Economic Development by Austrian economist, **Joseph Schumpeter**. Schumpeter highlighted the occurrence of discontinuous or revolutionary changes, as central to economic development which steer the economy away from its static mode, on to a path of dynamic growth. Elaborating on the importance of innovation in **'creative destruction'**, Schumpeter asserts that innovation is a 'process of industrial mutation, that incessantly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one.' This positive correlation between innovation and economic growth has been validated

[6]Source: Deloitte Consulting's Jim Moffatt on disruption, innovation and coaching T-ball; Bloomberg Business
[7]Source: Innovation and Entrepreneurship (1985) Peter Drucker
[8]Source: The Economist – special report: Innovation (2007)
[9]Source: OECD and Eurostat (2005), Oslo Manual – Guidelines for Collecting and Interpreting Innovation Data

by numerous nation-wide studies and analyses.

Organizations such as the United Nations (UN), the Organization for Economic Cooperation and Development (OECD) and the European Union (EU) have intensified efforts to promote innovation and provide relevant statistics to measure countries' performance in innovation. Global Innovation Index (GII), a collaborative initiative of INSEAD, World Intellectual Property Organization (a specialized agency of the United Nations), Cornell University and the Confederation of Indian Industry (CII) as the knowledge partner is one such indicator. GII ranks countries in terms of their enabling environment to innovation and innovative practices. Recognizing the role of innovation as a driver of economic growth, GII aims to capture the multi-dimensional facets of innovation which are applicable to developed and developing economies. In doing so, it helps leaders and policy makers to move to a more holistic analysis of innovation drivers and outcomes. GII covers 143 economies around the globe using eighty one (81) indicators across a range of themes, thereby presenting a comprehensive landscape of innovation in these countries. Some of the key outcomes of the ranking study are as follows:

• **Top Performers:** In GII 2015 edition, most top slots were occupied by European countries. These include Switzerland, United Kingdom, Sweden Netherlands, United States of America, Finland, Singapore, Ireland, Luxembourg and Denmark. Singapore is the only Asian countries that made it to the top 10. While ranking regions in terms of overall scores attained on GII parameters, the following order was observed (ranked from highest to lowest scores):

1. North America
2. Europe
3. South East Asia and Oceania
4. Northern Africa and Western Asia
5. Latin America and Caribbean
6. Central and Southern Asia
7. Sub-Saharan Africa

• Sub-Saharan Africa has seen tremendous improvement in terms of GII rankings and innovative practices. Many countries in the region have demonstrated rising levels of innovation, particularly in the areas of human capital and research and market sophistication. This result can be attributed to the implementation of innovation supporting initiatives and programs by governments of African nations. For example, the government of Rwanda has established the Rwanda Innovation Endowment Fund (RIEF) to foster innovative areas and fund research and development activities, in collaboration with the United Nations Economic Commission for Africa (UNECA). Other regional initiatives include the Children and Community Initiative for Development (CAID) and the Africa Youth Panel (AYP) which have launched capacity building programs in Sub-Saharan Africa.

• Brazil, Russia, India, China and South African (BRICS) economies have shown signs of improvement and have performed well on knowledge, technology and institutions indicators. Amongst the BRICS countries, the fastest progressing country has been China. India, on the other hand lags behind as it is faced with acute challenges in the education sector, despite possessing strong infrastructure and better performance in R&D and knowledge diffusion.

2.3 Global Programs in the Innovation Space

Various internationally renowned government and not-for profit organizations are devoted to the cause of supporting innovation and innovation-intensive activities. Some of the prominent initiatives are:

The Krabi Initiative

The Krabi Initiative is the outcome of the Association of South East Asian Nations Committee on Science and Technology (ASEAN COST) retreat on the Future of Science, Technology and Innovation 2015, held in Krabi province, Thailand. A strategic decision to raise competitiveness for sustainable and inclusive ASEAN, the initiative has been used to enhance the current ASEAN plan of action on science and technology (APAST 2011-2015). The Krabi Initiative has

identified the following thematic areas of action:

• **Innovation for Global Market –** utilizing ASEAN's innovative capabilities and locally available resources in products and services to benefit common people, improving the quality of life in the form of emerging technology.

• **Digital Economy, New Media and Social Networking –** improving the accessibility and affordability of ICT and useful applications covering social networking, mobile communication, disaster management, healthcare and gender equality.

• **Green Technology –** upgrading industry by making use of low-carbon and cleaner technology.

• **Food Security –** productivity improvement and optimization, appropriate mechanization of farms, food safety standards and access to adequate nutritional requirements.

• **Energy Security –** increasing energy efficiency and developing next-generation alternative energy sources.

• **Water Management –** to ensure stable access to clean water, this initiative would extensively promote innovation to facilitate water utilization and waste water treatment, mitigate disaster from flood and prevent water scarcity.

• **Biodiversity for Health and Wealth –** efforts for preservation and appropriate use of resources including collective discovery of new species, effective preservation methods, creating values from biodiversity and applying it to food, health and energy areas.

• **Science and Innovation for Life –** paving the way for capacity building and lifelong learning through the creation of an innovative eco-system in schools, higher educational and vocational institutions as well as linking learning systems to professions.

The initiative proposes to implement these programs through the following instruments:

• Greater role of Committee on Science and Technology (COST), governments and advisory bodies, along with inter sectoral coordination with other ASEAN bodies.

• Identifying gaps, and challenges in the implementation of science, technology and innovation interventions, including measures to address the gaps and challenges.

• Developing mechanisms to effectively pursue public-private partnerships in promoting science, technology and innovations.

• Putting in place a result based monitoring and evaluation mechanism for the implementation of thematic areas of action.

Another major initiative of ASEAN to promote innovation is the **ASEAN-EU STI (Science, Technology and Innovation) Days Program.** This is a forum style event which brings together researchers, scientists, innovators and policy makers for an annual three day conference on science, technology, innovation issues and bi-regional cooperation in these fields. The program comprises scientific workshops and expert sessions, exhibitions showcasing innovations, field visits to research facilities and brokerage and networking events to facilitate partnerships between researchers.

UNICEF Innovation Projects

UNICEF Innovation is an inter-disciplinary team responsible for building and scaling innovations that improve the lives of children. The UNICEF Innovation Network consists of:

• An innovation unit in the UN headquarters at New York, to support UNICEF programs on ground through integration of technology and partnerships with industry and academia.

• 14 innovation labs around the world – spread from Armenia to Zambia, this network of collaborative incubation accelerators aim to bring together public, private and academic sectors to develop solutions to solve social issues.

• A node in San Francisco – to scale social innovation start-ups and build partnerships with the technology sector.

• An innovation centre in Nairobi, Kenya – to identify and field test scalable innovations.

• An innovation group in Copenhagen – to work closely with private sector and other partners on supply and product innovation.

A recent initiative of the UNICEF has been the Innovation Fund, a first of its kind experiment to encourage innovations across the globe. The objective of the fund is to create self-sustaining innovative projects. The fund offers staged financing, evaluation and monitoring services and technical expertise from the globally recognized UNICEF Innovation team.

InfoDev

A global, multi donor program of the World Bank group, **InfoDev** supports growth oriented entrepreneurs through innovation hubs and business incubators. It has the following components:

• **Mobile Innovation Program (MIP) –** supports mobile applications business by enabling entrepreneurship in the mobile industry, building mobile innovation communities and studying the app economy of emerging markets.

• **Climate Technology Program (CTP) –** aims to transform climate change challenges to market opportunities. It works to accelerate climate technology innovation and entrepreneurship.

• **Agribusiness Innovation Program (AIP) –** seeks to catalyze the agro-processing sector's growth by creating greater benefits such as inclusive and sustainable growth and generating employment.

• **Access to Finance –** helps new ventures and start-ups gain access to early stage finance and mentorship.

• **Entrepreneurship Program for Innovation in the Caribbean (EPIC) –** funded by the Government of Canada, EPIC is a seven-year program to help create a robust ecosystem of inclusive development in the region.

• **Innovation Centres –** under this program, InfoDev supports different practice communities around the world with knowledge sharing, formation of peer networks and financial support in the areas of mobile innovation, climate technology and agribusiness in the form of mobile labs, mobile hubs, climate innovation centres and agribusiness innovation centres. Through these programs, InfoDev has supported more than 70 business incubators in over 50 developing countries.

Innovation Union

The Innovation Union is an initiative of the European Union (EU). A part of the Europe 2020 strategy, it aims to create sustainable and inclusive growth, by creating an innovation friendly environment and improving conditions and access to finance for research and development. The initiative comprises of more than 30 action points. Objectives of the program include:

- Promoting excellence in education and skills development
- Focussing EU funding instruments on Innovation Union priorities
- Delivering on the European Research Area (ERA) – a unified knowledge, technology and research sharing network
- Promoting the European Institute of Innovation and Technology (EIT) as a model of innovation governance in Europe
- Enhancing access to finance for innovative companies
- Creating a single innovation market
- Promoting openness and capitalising on Europe's creative potential
- Spreading the benefits of innovation across the Union
- Increasing social benefits
- Pooling forces to achieve breakthroughs through European Innovation Partnerships
- Leveraging EU policies externally
- Reforming research and innovation systems
- Measuring progress of European economies

Fast-paced change in key macro-economic areas in the past couple of decades has necessitated thinking out of the box. Key factors behind the need for innovation are changing market dynamics, increased competition, opening up of new market territories, changing consumer preferences and decreasing product life cycles. It has become virtually unavoidable to constantly work on discovering new ideas and products; thereby **'innovating'** becomes a necessity for any representative firm or entity to sustain its market presence.

2.4 Need for Innovation in India

The second factor augmenting the need for innovation is increasing international trade. Factors such as declining obstacles to trade and free movement of knowledge, goods and services; along with global agglomeration have reinforced the significance of this need. As other nations continue to attain technological advancement, the need for a country to **'keep up'** by innovating becomes greater.

Rapid diffusion of knowledge and information technology is another global factor which has created a need for innovation. As more and more knowledge and information is disseminated, greater insights, capabilities and skills are generated which further emphasize the need for innovation in a knowledge based economy.

However, in the context of a developing country such as India, the basic impetus to innovate stems from the necessity of making improvements in living conditions and the overall environment. Decelerated human development is a major factor which necessitates innovation; as indicated by India's consistent low rankings on the Human Development Index (HDI)[10]. As per recent HDI rankings released in 2014, India ranks 135th amongst 177 countries, down from 134th in 2011. With a Gross National Income (GNI)[11] per capita of USD 5,350[12], more than 55 per cent of the Indian population is classified as 'poor.' Approximately 32.68 per cent of the total population lives on less than USD 1.25 per day. Employment statistics of the country also present a dismal picture. Rate of unemployment in the country is 4.9 per cent. Despite a labour force participation rate of 52.5 per cent, more than 44.79 million people are classified as unemployed. Such a result has been attributed to high rates of unemployment amongst the educated class (graduates and post graduates). More than 13 per cent of the Indian population in possession of first and second level degrees are unable to become employed. The country continues to suffer due to low literacy. Despite the implementation of national level education schemes such as Sarva Shiksha Abhiyan (SSA), the country has registered a gross drop-out rate of 58 per cent for students of classes I to V.

India is marked by low literacy, poor levels of educational attainment, extreme poverty, large scale unemployment and dominant bureaucracy; thus, the scope of innovation becomes greater as a means to resolve these challenges.

2.5 Drivers of Innovation Led Growth

Overall context in which innovation takes place in developing countries is determined by global and institutional causes.

Globalization is the first cause which manifests itself through the importance of trade within the global economy. Reducing distances throughout the world, globalization has linked the remotest of areas. Also, the increased competition brought about by globalization requires intensified efforts to strengthen existing areas of specialization and support the development of emerging sectors. Circulation of knowledge and of skilled people is a key characteristic of globalization. Thereby, the free movement of knowledge and skills is instrumental in stimulating innovative practices and activities. It has been increasingly reported that by exposing domestic producers to stronger competition from foreign products, exporting provides an incentive to innovate. It has been discovered that entities exporting their goods are able to spread their fixed costs of innovation over a large customer base; in turn exports can support innovation. Also, firms directly exporting their products appear to be more likely to be engaged in R&D and introducing new products, processes, marketing methods and organizational innovations than firms catering only to domestic markets.

Another cause which is driving innovation-led-growth is technological improvement and R&D. Scientific advances made in the foundations of life, matter, energy and time prompt innovative practices. Research and statistics reveal that R&D significantly increases the likelihood of innovation. It has been found that firms investing in R&D are 22 per cent per cent more likely to introduce new products or processes in the market. Also, investing in R&D has the largest impact on the probability of introducing a new product in high-tech manufacturing sectors; namely electrical equipment and pharmaceuticals.

[10]Human Development Index (HDI) is a summary measure of average achievement in key dimensions of human life: a long and healthy life, being knowledgeable and having a decent standard of living. The HDI is the geometric mean of normalized indices for each of the three dimensions.
[11]GNI per capita is the Gross National Income (the sum of value added by all resident producers plus any product taxes; less subsidies not included in the valuation of output plus net receipts of primary income from abroad); divided by mid-year population.
[12]Based on 2011 International Comparison Program (ICP) database, World Bank.

Another successful driver of innovation is skilled human capital. Suitably skilled workforce, equipped with strong managerial skills, is a key pre-requisite and stimulant for innovation; both with the innovation of technology and the adoption of existing technology, as workers are required to develop and learn new production techniques.

A crucial factor, specific to India, has been institutional changes introduced in the policy framework – policy mechanisms promoting innovation and R&D. Department of Science and Technology (DST), under Ministry of Science and Technology has established various scientific programs, partnerships and boards to encourage innovation and R&D. Notable examples include National Science and Technology Development Board (NSTEDB), scientific and engineering research missions, technology development programs, technology business incubators, women scientist programs and international science and technology (S&T) cooperation divisions.

A momentous policy initiative has been the launch of Science, Technology and Innovation (STI) Policy 2013. STI Policy targets the creation of a national innovation ecosystem as a prime policy objective. STI policy is expected to drive investment in science, science led technology and innovation in socio-economic spheres, thereby creating inclusive innovation; ensuring access, availability and affordability of solutions to as large a population as possible. By developing a symbiotic relationship with economic policies, it will emphasise on bridging the gaps between the STI system and socio-economic sectors.

2.6 Landscape of Innovation in India

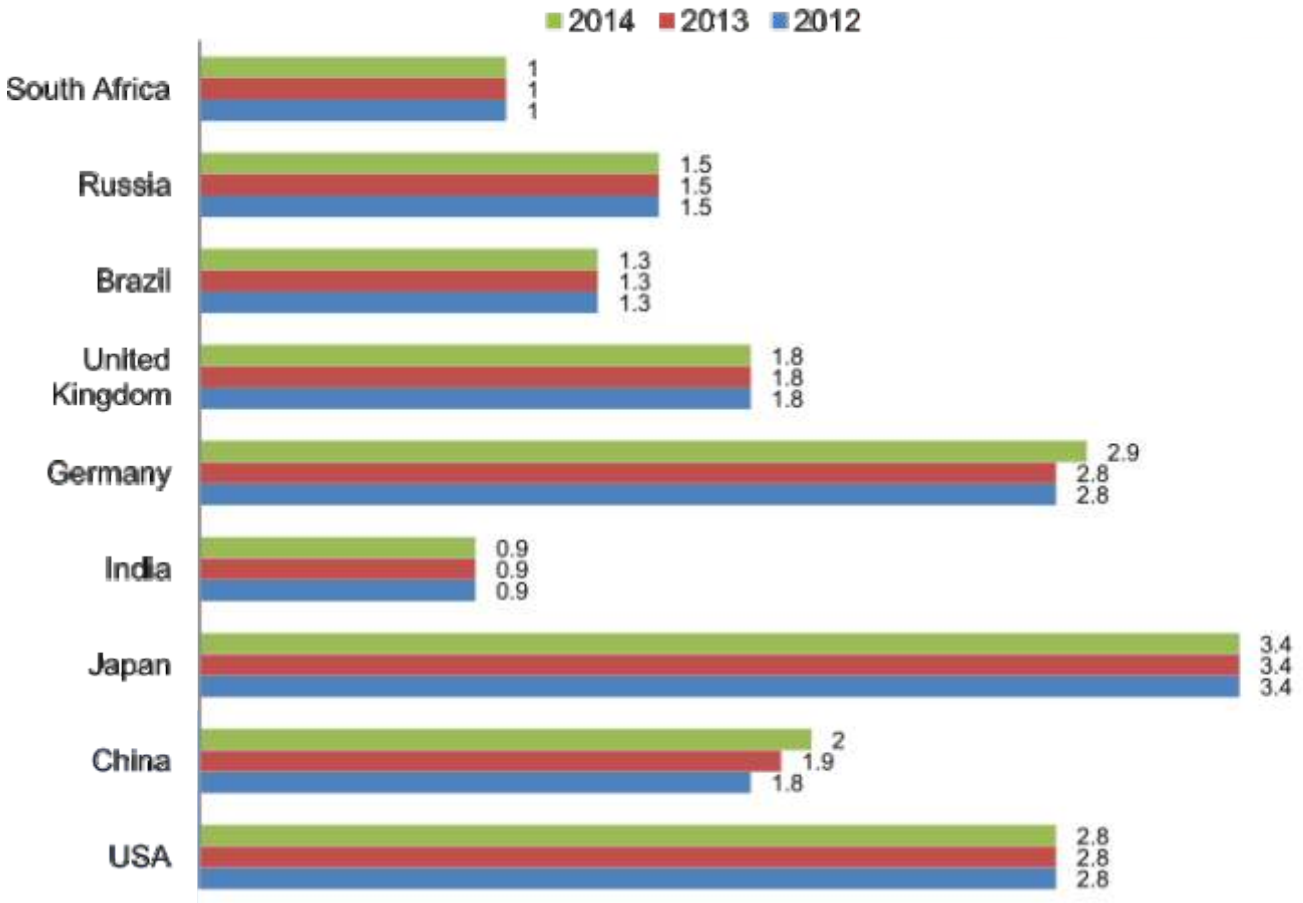
Relative Position of India in the Field of Innovation

India is a knowledge driven economy and has had a culture of innovation, though this innovation has been more incremental than substantial and aimed primarily at reducing cost of existing applications and processes. The country is home to several inventions and discoveries in a variety of fields, ranging from mathematics, sciences, agriculture and medicine to philosophy, arts, culture and music. Details of such innovation have been showcased in the later part of this section. Recent decades too have been witness to numerous inventions by Indian innovators. Several national flagship schemes and policies are in place to encourage innovation in India.

However, according to empirical data and indicators measuring innovation, the country has consistently performed below expectations. Statistics[13] reveal that India has a 2.7 per cent share in global R&D spending, a value which has remained consistent between 2012 and 2014. On the other hand, China and Japan make up 17.5 per cent and 10.2 per cent of the global R&D expenditure respectively. As depicted in the figure below, as percentage of GDP, R&D expenditure is forecasted to form a miniscule 0.9 per cent in India, which is much below the global average of 1.8 per cent. On the other hand, for countries such as Germany, USA and China, R&D expenditure as a proportion of GDP has already exceeded the 2 per cent mark. Japan at 3.4 per cent has registered the highest expenditure on R&D as a percentage of GDP, as depicted in **figure 1**.

[13]Source: Batelle 2014 Global R&D Funding forecast

Figure 1: Gross R&D Expenditure % as a proportion of GDP



Innovation indices also point towards India's poor performance in the innovation space. A good example is the **Knowledge Economy Index (KEI)**[14], developed by World Bank. In the Knowledge Economy Index for 2012, the top 10 spots are occupied by Sweden, Finland, Denmark, the Netherlands, Norway, New Zealand, Canada and Australia. Hong Kong and Taiwan are the only Asian countries in the top 20, while India is ranked 110th amongst 145 countries. (The KEI is an aggregate index indicating a country's overall preparedness to compete in the knowledge economy. KEI is based on an average of four sub-indices, representing four pillars of the knowledge economy; namely economic incentive and institutional regime (EIR), innovation and technology adoption, education and training and information and communication technologies (ICT) infrastructure).

India's KEI rank has fallen by 6 spots since 2000. Though the country has registered an increase in number of patents filed, an inefficient innovation ecosystem combined with institutional regimes and weak ICT infrastructure are believed to have contributed to this decline.

Another indicator measuring India's performance in innovation is the Global Innovation Index (GII), developed by INSEAD, World Intellectual Property Organization and Cornell University, with Confederation of Indian Industry (CII) as one of the knowledge partners. In GII 2015, India's rank has come down to 81st position from 66th position in 2014. India is also behind other middle income, developing economies such as China, Brazil and Russia, despite possessing strong infrastructure and R&D capabilities due to an underdeveloped education sector.

[14]The KEI is an aggregate index indicating a country's overall preparedness to compete in the knowledge economy. KEI is based on an average of four sub-indices, representing four pillars of the knowledge economy;namely economic incentive and institutional regime (EIR), innovation and technology adoption, education and training and information and communication technologies (ICT) infrastructure).

Table 1

S. No.	Country	Change in Rank (b/w 2014 and 15)	Rank in 2015	Rank in 2014	Rank in 2013
1	Brazil	-9	70	61	64
2	Russia	+1	48	49	62
3	India	-5	81	76	66
4	China	0	29	29	35
5	South Africa	-7	60	53	58

As depicted in **table 1** above, all BRICS countries witnessed a fall in GII rankings between 2014 and 2015 with only Russia improving by 1 rank and no change in China's ranking. India however dropped a further 5 ranks and had previously dropped 10 places in 2014 vis-a-vis their 2013 ranking.

Perhaps the most crucial indicator of India's poor performance in innovation has been its absence from even the top 50 in the **Bloomberg Innovation Index**[15]. Asian countries such as South Korea, Japan, Israel and Singapore occupy top places in this index.

History of Innovation in India

India is home to numerous discoveries and breakthrough inventions. Earliest innovation to come out of India was the invention of the number zero (0), coined by Aryabhata in 500 AD. Other examples of ancient Indian innovations include the decimal system, ornamental buttons, carbon pigment, ayurvedic medicine and plastic surgery. 20th and 21st centuries were marked by a variety of path breaking innovations. A timeline of innovations in India is presented below in Table 2:

[15]The Bloomberg Innovation Index is an annual ranking of how innovative countries are and is based on six parameters; research and development, manufacturing, education, research personnel, patents filed and hi-tech companies.

Table 2

Phase/ Year of Launch	Field(s)	Innovation	Description
Early 20th Century	Mathematics	Ramanajun's mathematical theorems and concepts	S.Ramanujan's significant innovations were in the field of game theory and mathematics including mock theta functions, Ramanujan's conjecture, prime counting function, Soldner constant, theta function and mathematical identities on hyper geometric series.
Early 20th Century	Botany	Cresco graph	The Cresco graph was a device for measuring plant growth and was discovered by Dr JC Bose. It was also used to measure plant response to various stimuli, thereby proving parallelism between plant and animal tissues.
1928	Physics	Raman Effect	Inelastic scattering of photons in light, discovered by CV Raman in 1928. CV Raman was conferred the Nobel prize in physics for this discovery, and it paved the way for many similar experiments.
1950s	Nuclear Science	Three Stage Nuclear Power Program	Conceptualized by Dr Homi Bhabha, the program sought to develop nuclear power and secure the country's energy independence. The program was adopted by government of India in 1958. The objective of the program was to enable the utilization of thorium reserves of India to meet the country's growing energy requirements.
1960s	Food and Agriculture	Green Revolution	The Green Revolution was introduced in the early 1960s through high yielding varieties of seeds and modern agricultural implements. It was instrumental in helping India achieve self-sufficiency in food production, as the country attempted to recover from extreme poverty and food scarcity, in the aftermath of colonial oppression.
1968	Health, Assistive Technology for the Disabled	Jaipur Foot	Prosthetic leg for people with below knee amputations developed and designed by Ram Chandar Sharma. Jaipur foot is a cost efficient, lightweight and durable prosthetic leg which allows a range of movements for the user. It has become the most widely used prosthetic in the world.
1970	Food and Agriculture	Operation Flood	Commonly known as the 'Milk Revolution'. Operation Flood was the largest dairy development program in India. A project of the National Dairy Development Board (NDDB), the program helped India reduce malpractices in dairy and augment milk production and rural incomes.
1974	Pokhran – 1	Nuclear Power	Pokhran – 1 was India's first accelerated nuclear weapons program and the first confirmed nuclear test by a non-permanent member of the UN Security Council.

1976	Aravind Eye Care	Health and Healthcare	Chain of specialized eye hospitals founded in 1976, providing inexpensive surgeries and eye-care services
2000	Healthcare	Low cost Hospital	Innovative ideas like leasing equipments, reducing the cost of the surgeries through various practices, has led Narayana Hridayala to maintain low costs & quality healthcare for its patients
2007	FMCG	Premium products in sachets	Unlike rival companies, which were rushing to give their brands premium status, Godrej took a calibrated approach. It decided to upgrade consumption habits at the bottom of the pyramid by offering quality products at value prices.
2008	Space and Technology	Chandrayaan – 1	Designed and launched by Indian Space Research Organization (ISRO), Chandrayaan – 1 was India's first mission to the moon. The greatest achievement was the discovery of the presence of water molecules on lunar soil.
2011	Information and Communication Technology	Aakash Tablet	Low cost android based tablet computer introduced by Indian government as a part of the one laptop per child (OLPC) initiative.
2014	Banking and Financial Services, Social Innovation	Solar Powered ATM	Developed by Vortex Engineering, this is a first of its kind ATM for rural India. The solar powered ATM utilizes less than 10 per cent of the power used by regular ATMs and can operate under temperatures of up to 50 degree Celsius, without air conditioning.
2014	Navigation, Health, Assistive Technology for the disabled	Lechal Shoes	Smart technology footwear with haptic feedback based navigation. Fitted with insoles, when synced with Google maps, these shoes direct the user towards his/her destination. These shoes were designed to help blind people navigate and also serve as a pedometer.

2.7 Weaknesses and Obstacles to Innovation in India

Though India has made significant strides as a global provider of information technology and services, the country continues to face many challenges which are restricting innovative practices and activities. Some of these challenges include:

Low Levels of Learning Outcomes

Despite the implementation of nationwide education and literacy schemes, India continues to be plagued by low levels of educational attainment, as implied by the various indicators measuring skill development and education.

As per ASER 2014, 2014 is the sixth year in a row that enrolment levels are 96 per cent or higher for the 6-14 age

groups. The proportion of children currently not in school remains at 3.3%. However the overall, the situation with basic reading continues to be extremely disheartening in India. In 2014, in standard III, only a fourth of all children can read a standard II text fluently. This number rises to just under half in standard V. Even in standard VIII, close to 75 per cent children can read standard II level text (which implies that 25% still cannot). The percentage of children in standard II who still cannot recognize numbers up to 9 has increased over time, from 11.3 per cent in 2009 to 19.5 per cent in 2014 Though the proportion of those attending higher education institutes has increased over the decades, this growth has been confined to a few areas as most of this growth has been concentrated in a few fields; namely engineering, pharmaceutical sciences, computer applications and management; while humanities and social sciences have largely been neglected.

Unsatisfactory Quality of Education

With more than 1.5 million engineers graduating every year, India has the largest aggregate technical workforce in the developing world. However, a pressing concern is the quality of these graduate engineers. In order to maintain the quality of engineering education, it is imperative to improve the quality of faculty at engineering schools. With a shortage in PhDs and Masters Degree holders in engineering and science fields; the quality of teachers has also greatly suffered. Though the government through its various departments have resorted to measures and amendments to resolve the quality issue, most of these have remained confined to regulatory or infrastructural reforms, thereby making little improvement to the quality of education that is imparted. Close to half of the faculty at most technical institutions are temporary and possess limited experience in research.

Limited University Investment in Public Research

Another factor restraining innovation is public research being concentrated in autonomous research institutes instead of universities. A few leading institutes such as the Indian Institute of Technology (IITs) are now focussing on research more than earlier; much of publicly funded research is done through autonomous research institutes. Most other economies concentrate public research within the university system except India which continues to allocate over 90 per cent of its public research expenditure within autonomous research institutes. Experience of successful economies such as South Korea and Taiwan indicate that the flow of innovation runs sequentially from industrial development to in-house R&D and then to public scientific research. An industrial sector competing with the best firms in the world in sophisticated industrial sectors is a pre-requisite for sustaining investment in in-house R&D, and strong R&D is a requirement for sustaining investment in public scientific research. However, the Indian industry only opened up to competition with other firms in 1991; post the new economic policy.

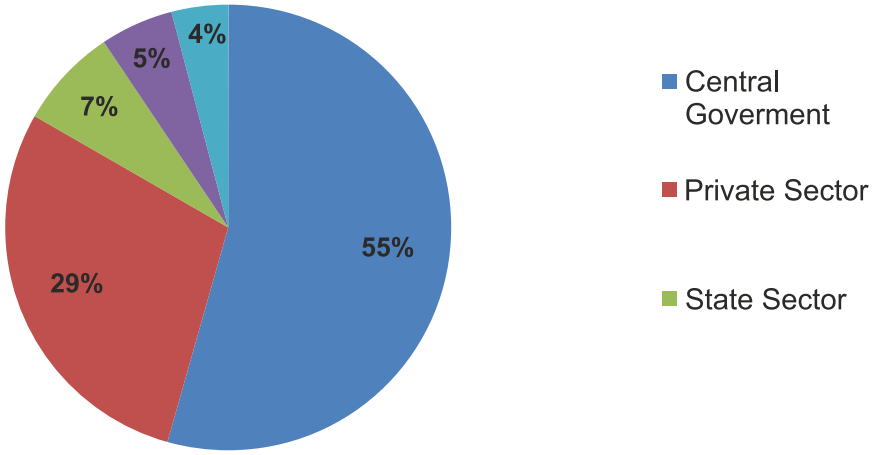
Distribution of Workforce

Roughly 90 per cent of the Indian population is employed in the informal sector; while less than 3 per cent works in the modern private sector. This heterogeneity in employment is reflected in the form of wide discrepancies in productivity levels; which limits innovations in different spheres.

Low Expenditure on R&D

India's gross expenditure on research and development (GERD) is USD 40 billion, accounting for 0.9 per cent of the GDP. Accounting for 2.7 per cent of Global R&D expenditure, India ranked 8th in terms of R&D investments. However, the GERD is mainly driven by the government sector with the central government accounting for more than 55 per cent of national R&D expenditure. As depicted in figure 2, Central government has the maximum contribution in national R&D expenditure with the private sector coming second at 29 per cent. Higher Education's contribution to R&D expenditure is the least at 4 per cent.

Figure 2: National R&D Expenditure Sector Wise



Limited Focus in Innovation Sphere

In the Indian innovation eco-system, most R&D activities and initiatives continue to be concentrated in a few select sectors such as engineering, automobiles & electronics, IT, pharmaceutical sciences and medicine. Recent government initiatives which aim to set up R&D centres and reform innovation are also directed at these sectors. Such a restricted ambit weakens the scope and motivation for social and other non-technical innovations in the country. Sectoral contribution to R&D too depicts a similar picture; with IT, pharmaceuticals & drugs and transport accounting for the maximum share in R&D expenses.

Policy Weaknesses

The Science, Technology and Innovation Policy 2013 (STI Policy 2013) was unveiled by the previous government amidst great enthusiasm and support from the scientific community. However, the policy is inherently replete with issues. The most serious issue of the STI policy is its inability to address the fact that scientific and university research is on the verge of obsolescence in the current system. In the absence of fundamental changes, higher research output is translated in the form of increase in volume of papers published and patents filed; without any improvement in the quality of S&T research. Another drawback of the policy has been a mistaken reliance on private sector. Research proves that the track record of Indian private sector in R&D and research expenditure has been poor, with a few notable exceptions. Despite significant government initiatives; including 135 per cent tax relief, corporate are reluctant to invest in research. Large Indian corporations find it easier to enter into new collaborations, buy or import technologies instead of innovating and developing new technologies and products. India's 'harbinger' of development in services – the IT and software sector has witnessed very few software innovations while it continues to perform back-office tasks for trans-national corporations. R&D has long gestation periods while the Indian private sector works for fulfilment of short term goals. The prime objective of making profit takes precedence over generating socio-economic benefits for the community. The policy's declaration to source additional R&D investment from the private sector is akin to little or no investment in R&D. Another shortcoming of the policy has been conflict in key objectives – as seen in the government's target to 'tackle problems of societal development; including pressing problems of energy, environment, food, nutrition, water, habitat, skill development, employment and sanitation through science and technology.' Here, the policy has overlooked the fact that realizing these goals requires different approaches and instruments for each. The view that STI will yield social goods is a manifestation of the trickledown effect, and a rather naive expectation to have. Social goods are a result of state policy reforms and cannot emerge from science and technology advancements alone. To conclude, the

[15]The Bloomberg Innovation Index is an annual ranking of how innovative countries are and is based on six parameters; research and development, manufacturing, education, research personnel, patents filed and hi-tech companies.

policy has failed to address institutional weaknesses, structural problems and ground realities. Though it has set out ambitious goals and a new paradigm synergizing science and technology with innovation, it does not specify how the gap between goals and achievements will be bridged. Another recent 'misdirected' initiative of the government, as outlined in Union Budget 2015 is the decision to establish new national institutes of excellence including; All India Institutes for Medical Sciences (AIIMS) in Jammu and Kashmir, Punjab, Himachal Pradesh, Tamil Nadu, Bihar and Assam; Indian Institutes of Management (IIM) in Jammu and Kashmir and Andhra Pradesh and Post Graduate Institute of Horticulture Research and Education in Amritsar. Instead of focussing on improving the quality of teaching and research capabilities, the government has simply increased the quantity of such institutes. This sole focus on infrastructure expansion, without improvements in quality only results in high capital expenditure; further straining the government's resources; thereby limiting opportunities for innovation.

Institutional Weaknesses

India is marked by poor institutions – weak rule of law, high incidence of corruption and burdensome bureaucracy. In the absence of a single, transparent, meritocratic organization to administer science and technology, there is an overhaul of bureaucratic agencies overseeing the sector. Moreover, most scientific organizations in the country are modelled on bureaucracy. For instance, despite the efforts of the Council of Scientific and Industrial Research (CSIR) to root out corruption, it has been accused of becoming a ritualistic, overly bureaucratic organization doing little more than publishing papers. Contrast this with the system followed in developed countries such as the US wherein the National Institutes of Health (NIH) and the National Science Foundation (NSF) are outside the purview of government bureaucracy. Another weakness in the system is the lack of lateral movement from one institution to another. Collaborative partnerships amongst scientists from different institutions are rarely seen in India. Very few national frameworks for intra-institute collaborations exist. Moreover, funding is also provided for collaborations within than across institutions. The combination of such institutional weaknesses is found to increase the cost of introducing new products and processes; also increasing the uncertainty of returns to investment in new products and technologies, thereby limiting innovation.

3. POLICIES, PROGRAMS AND AGENCIES PROMOTING INNOVATION IN INDIA

Various government, private and not for profit bodies have undertaken initiatives and measures to develop the innovation ecosystem and encourage innovative practices in India. The innovation landscape in India is marked by a number of stakeholders in the government, private and non-profit sectors, classified as follows –

1. Government Agencies and Departments

2. Private Companies

3. Not-for-profit Organizations

4. Business Incubators

•Independently Founded Incubators (Private/Public)
•Institute/Organization Sponsored (Private)
•Government Supported Technology Business Incubators (TBIs)

3.1 Government Policies and Programs

In this regard, a recent policy initiative of the government of India is the Science, Technology and Innovation Policy 2013. In continuance to the Science and Technology Policy 2003 (STP); STI Policy targets the creation of a national innovation ecosystem as a prime policy objective. India has declared 2010-2020 as 'the decade of innovation'. Thereby, the government has stressed the need to formulate a policy to synergize science, technology and innovation. In continuance of these pronouncements, STI Policy has been launched. Chief objectives of the policy are:

1. Promotion of Science, Scientific Education and Innovation

- Promoting the spread of scientific temper amongst all sections of society.
- Enhancing skills for applications of science among the youth from all social strata.
- Making careers in science, research and innovation attractive enough for talented and bright minds.
- Linking contributions of science, research and innovation system with the inclusive economic growth agenda and combining priorities of excellence and relevance.
- Seeding S&T based high risk innovations through new mechanisms.
- Fostering resource optimized, cost effective innovations across science and technology domains.
- Triggering changes in the mindset and value systems to recognize, respect and reward performances which create wealth from science and technology derived knowledge.
- Creating a robust national innovation system.
- Positioning India among the top five global scientific powers by 2020.

2. Up-gradation of Research & Development (R&D) facilities

- Establishing world class infrastructure for R&D for gaining global leadership in selected frontier areas of science.
- Creating an environment for enhanced private sector participation in R&D.
- Enabling conversion of R&D outputs into societal and commercial applications by replicating hitherto successful models and establishing new Public Private Partnership (PPP) structures.

To attain these objectives, government agencies will subscribe to the following measures and methods:

Policies to Promote Scientific Education and Research

- Creation of a policy framework to enable science

education reforms in schools by improving teaching methods, science curricula, motivating science teachers and schemes to attract talent to science.

- Multiplication of discipline specific and multi-disciplinary inter university centres in different fields to enable a wider cross section of university researchers tomore access to advanced research facilities and equipment which are otherwise not abundantly available in university environments.
- Stimulation of research in universities through special incentive mechanisms.
- Greater investments in basic research for fostering excellence against global benchmarks focussing on relevance for addressing national challenges.
- Performance related incentive scheme (PRIS) – a transparent, centrally implemented scheme based on past and proven track record in research will be put in place to enable grant based investments to such performers.
- Participation in international projects to encourage access to advanced research facilities.

Schemes to Address Challenges of Women Scientists

- New and flexible schemes shall be put in place to attend to mobility challenges of women scientists and technologists.
- Scope for re-entry of women into R&D will be broadened and facilitation mechanisms for special career paths will be devised.

Focussed Policies for Priority Sectors

- Ten (10) priority sectors of high potential growth will be identified. These sectors will be eligible for STI intervention and deployment of requisite resources. Policy instruments that facilitate both institutional research and R&D enterprises to focus their efforts in these areas will be put in place.
- R&D policy for agriculture (developed by the Indian Council of Agricultural Research) will be integrated with the national R&D system.
- Creation of a National Action Plan for Climate Change (NAPCC) to address climate variability and change. The STI system will also serve as a source of strategic knowledge to cope with challenges of climate variability.

Public Private Partnerships (PPP)

- Public funds will be earmarked for partnerships with the private sector for social and public good objectives. A National, Science, Technology and Innovation Foundation will be established as a PPP initiative for investing critical resources in ambitious projects.

Formulation of Linkages Between Different Sectors

- Strengthening linkages between scientific and socio-economic sectors - measures will be taken to ensure that state-specific S&T vision and plans are informed and guided by the new STI policy. NGOs will be accorded a pivotal role in the delivery of STI outputs, especially rural technologies at the grassroots level.
- Special innovative mechanisms to create industry-academia linkages will be devised. Mobility of experts from academia to industry and vice-versa will be facilitated. Regulatory and legal framework for sharing of IPRs between inventors and investors will be put in place. Measures to close gaps in transition of new R&D findings and grassroots innovations into the commercial space will be taken.

Other innovation promotion programs and initiatives specifically undertaken and supported by government institutions have been detailed below:

Government Initiatives

A) Department of Science and Technology (DST), Ministry of Science and Technology

As a part of the Ministry of Science and Technology, the department of science and technology was established in 1971 with the objective to promote new areas of science & technology. DST is the apex body for organizing, coordinating and promoting science, technology and innovation practices in India. Major initiatives and schemes of DST include:

National Innovation Foundation (NIF)

An autonomous body under DST, the NIF was set up in 2000 as India's national initiative to strengthen the grassroots technological innovations and outstanding traditional knowledge. The mission of the foundation is to help India become a creative and knowledge based society by expanding policy and institutional space for grassroots technological innovators. NIF has till date recognised more than 775 grassroots innovators and school students at the national level in its various award functions. Through the collaborations with various R&D and academic institutions, Agricultural and Veterinary Universities and others, NIF has helped in getting thousands of grassroots technologies validated. It has also set up a Fabrication Laboratory (Fab Lab) with the help of MIT, Boston, for product development apart from strengthening in-house research and development facilities for the initial validation of herbal technologies. Pro bono arrangement with patent firms has helped NIF to file over 725 patents on behalf of the innovators and holders of which thirty seven patents have been granted in India and five in the USA. Micro Venture Innovation Fund (MVIF) at NIF with the support of SIDBI has provided risk capital of over Rs. 384 lacs to 193 projects, which are at different stages of incubation. NIF has received over six hundred product inquiries from around 55 countries for various technologies, and has succeeded in commercialising products across countries in six continents and has been successful in materialising 89 cases of technology licensing. National Science and Technology Entrepreneurship Development Board (NSTEDB) Established under the DST, the NSTEDB is an institutional mechanism set up to promote knowledge and technology driven enterprises. The board seeks to promote high end entrepreneurship and generate employment using science & technology methods. Innovation programs introduced under NSTEDB are:

- **Innovation – Science and Technology based Entrepreneurship Development (i-STED)**

i-STED is a focussed program constituted to identify challenges and issues in an area/ industry /cluster and its solutions are based on technological interventions and innovative approaches. These solutions are further aligned with entrepreneurial opportunities to generate socio-economic development. Target beneficiaries of the program include young and educated entrepreneurs with an inclination to scale up their enterprises with innovative and technological interventions that have potential to impact the region. NSTEDB offers financial support to develop these projects along with helping the entrepreneur establish linkages with

relevant central and state government schemes, programs, financial and technical institutions.

- **Innovation and Entrepreneurship Development Centre (IEDC)**

With the mission to develop institutional methods to create entrepreneurial culture in academic institutions and to foster growth of innovation and entrepreneurship amongst faculty and students, IEDCs are established in academic institutions. These institutions may be universities, science colleges, engineering colleges and management schools which have requisite expertise and infrastructure. Under this program, these centres conduct numerous events, competitions and intensive challenges to advance innovative practices such as business plan competitions, entrepreneurship development programs, faculty development programs, skill development programs and development of innovative products. IEDCs also function as regional information centres on business opportunities, processes and technologies; integrating their activities with the host institutions.

National Council for Science and Technology Communication (NCSTC)

The NCSTC is a nodal body under DST that aims to popularize advances made in science and technology, enable informed decision making at the grass roots level and encourage debate on development issues. Important activities of the council pertaining to innovation encompass field programs for demonstrating innovative ideas of science popularization and outreach and extension activities namely – National Children's Science Congress, Science day celebrations, "Science Express—An exhibition train" on S&T, environmental awareness and positive action programs.

India Innovation Growth Program (IIGP)

The India Innovation Growth Program is a nation-wide project, created to enhance the growth and development of India's innovation and entrepreneurial economy. The program is equally funded by the Department of Science and Technology (Government of India) and Lockheed Martin Aeronautics Company, and has been developed with the assistance of the Indo-US Science and Technology Forum, the IC2 Institute at the University of Texas, and Federation of Indian Chambers of Commerce and Industry (FICCI). Prime objective of the program is to connect Indian

innovators to the global marketplace. This program is open to private individuals, government, and private and not for profit entities in any sector; across variety of fields such as aeronautics, agriculture, biotechnology, chemistry, communications, computing, defence, electronics, environment, healthcare, information technology, manufacturing, materials, life sciences, nanotechnology, petrochemical, semiconductors and transportation. Application process entails submitting an online application after which a team of experts evaluate the submission based on pre-defined criteria.

Top 50 innovations are invited to attend a week long Entrepreneurship Workshop - an intensive workshop that guides them through six key areas of technology commercialization and entrepreneurship. They are also given the opportunity to present their innovations to a panel of judges comprising of renowned technologists and commercialization experts from India and the USA. Winning innovations are selected for personalized business development services from FICCI & the IC2 Institute to develop and implement successful commercialization plans, connecting them with potential customers, investors or other partners in the United States and other locations. Also, two technology expositions are conducted each year to showcase the technologies awarded under the program and to announce the business engagements that result as a part of the business development carried out under the program.

Innovation in Science Pursuit for Inspired Research (INSPIRE)

INSPIRE is an innovative program launched by DST to attract talent for studying science and careers in research. The program is open to young researchers and PhDs in the 27-32 years age group. Awards include opportunity for contractual and independent research. INSPIRE programme has three components – I) SEATS, II) SHE and III)AORC and starts from early age not for age 27-32 only.

B) Department of Biotechnology (DBT), Ministry of Science and Technology

The Small Business Innovation Research Initiative (SBIRI) is the first of its kind, early stage scheme in the field of biotechnology launched by DBT. It supports high risk, pre-research and/or late stage development in small and medium companies led by innovators with a background in science. Extending to all major areas in biotechnology pertaining to healthcare, agriculture, industrial processes and environmental biotechnology and biomedical devices and instruments, the scheme provides mentorship, commercialization, networking and funding assistance to emerging entrepreneurs.

C) National Skill Development Corporation Innovations for Skills Challenge Program

NSDC Innovations for Skills Challenge Program is organized by National Skills Development Corporation (NSDC). The intent is to look for proposals, which will positively impact and create a multiplier effect in the skill development space. The proposals can be from enterprises, which have solutions to reduce cost, enable new processes and create a higher impact than the existing practices in the current skill development space. The challenge aims to identify and invest in 10 to 15 innovative fundable enterprises that are robust, have sustainable models to impact the skill development ecosystem by achieving faster, inclusive, and sustainable growth. Awards include debt investment opportunities of up to Rs. 3 crores along with non-monetary awards including; the Indus Entrepreneurs TiE mentorship for 6 months, access to discounted co-working spaces at reputed accelerators, access to major entrepreneurial events, networking opportunities and national visibility through online and offline media.

National Innovation Council

The National Innovation Council was set up in 2010 with the aim to discuss and implement strategies for inclusive innovation and prepare a roadmap for 2010-2020 - 'decade of innovation'.

The tasks of the National Innovation Council include:

a. Formulating a Roadmap for Innovation for 2010-2020

b. Creating a framework for:

- Evolving an Indian model of innovation, with focus on inclusive growth
- Delineating policy initiatives within the Government, required to spur innovation
- Developing and championing innovation attitudes and approaches
- Creating appropriate eco-systems and environment to foster inclusive innovation
- Exploring new strategies and alternatives for innovations and collaborations
- Identifying ways and means to scale and sustain innovations
- Encouraging Central and State Governments to innovate
- Encouraging universities and R&D institutions to innovate
- Facilitating innovations by SMEs
- Encouraging all important sectors of the economy to innovate
- Encouraging innovation in public service delivery
- Encouraging multi-disciplinary and globally competitive approaches for innovations

Some of the key initiatives supported by NIC are as follows:

- **Innovation Challenge (2011) –** With the intention to come up with innovative solutions to reduce problems of working class, the challenge seeks ideas in the areas of design improvement of work implements, business opportunities models; and improved equipments and techniques for different occupational groups. These innovations must not be labour displacing in nature. The challenge is open to applicants from various professional backgrounds such as students, engineers, government officials and teachers.

- **India Inclusive Innovation Fund (IIIF) –** Created in 2010 and implemented in 2014 is a for-profit entity focussed on social investment, established to provide funding to social enterprises with the aim of maximizing social impact with modest financial returns. The fund will invest in companies at different stages of growth and for scaling up successful business models. Total corpus of the fund is Rs. 500 crores with a maximum limit of Rs. 5,000 crores. The Government will contribute Rs. 100 crores initially and will later seek capital from different sources such as PSU Banks, Public Sector Enterprises, Multilateral agencies, Corporate, PE Investors and Investment Firms.

- **Industry Innovation Clusters –** The NIC proposes to create Industry Clusters within a PPP Ecosystem to facilitate the transfer of knowledge and skills between (academia and industry) stakeholders. Smaller Cluster Innovation Centres within these Industry Clusters will act as networking arms for various stakeholders, forging linkages, initiating and assisting innovative activities, providing guidance and organizing initiatives to promote growth.

Private and Non-Profit Initiatives

A) Confederation of Indian Industry - India Innovation Initiative (i3)

i3 is an annual innovation challenge, jointly organized by Confederation of Indian Industry (CII), Department of Science and Technology (DST) and All India Council for Technical Education (AICTE). The program's objective is to create an innovation ecosystem in the country by sensitizing, encouraging and promoting innovators and facilitating commercialization of the innovations. For this purpose, CII has partnered with the government, industry experts, business incubators, angel funds and venture capitalists. Eminent scientists, technologists, academicians, educationists and corporate leaders have been on the jury of the I3 challenge. Since the program's inception in 2010, there have been over 1,000 submissions from more than 50 cities across the country, with over 300 grass root innovators getting an opportunity to

showcase their projects on a national platform. Professional backgrounds of participants have been diverse; with students, researchers, IT professionals, individuals from MSMEs, academic institutions, public or private research labs and start-ups sending in applications. Focus areas of these innovations have been equally diverse, ranging from ICT, science, engineering, biotechnology, healthcare and energy; to music, entertainment, social innovations, assistive technology, and environment conservation. Top 5 innovators are rewarded with cash prizes and the opportunity to receive incubation, funding and commercialization assistance from prominent business incubators and venture capital funds (who served as partners during the course of the initiative).

The global practice of awarding grand prizes to spur innovation has now made its way to India. Many big corporate houses (mostly in technical sector such as Intel, Microsoft, Google etc.) and NGOs such as Bill and Melinda Gates Foundation (BMGF), US Agency for International Development (USAID) are challenging innovators to come up with revolutionary ideas which will have high impact on the Indian economy and society and in return will receive big bumper prizes ranging from thousands to millions of dollars. While this is one way to promote revolutionary innovation, the I3 challenge is focussed on grassroots innovation in India. The focus is on creating awareness about innovation among common people rather than promoting innovative thinking with the incentive of high monetary rewards. As the government is the main source of funding in the I3 challenge, CII is limited in its scope to reward the winners.

B) Mahindra and Mahindra Ltd

Rise is a scheme conceived by Mahindra and Mahindra Company, as a platform and resource to catalyse innovation. With separate programs for the grassroots and hi-tech innovators; covering innovation challenges, early stage investment assistance and residential incubator/ accelerator programs; it endeavours to create world changing breakthroughs in innovations. Major programs and services on offer are:

- **Rise Prize Solar Challenge/ Driverless Car Challenge:** These are twin innovation challenges to produce disruptive innovations which are affordable, small sized, do-it-yourself, rooftop solar kit and a driverless car that works in Indian conditions. The competitions are open to individuals, organizations and institutions from India. These challenges are an opportunity to network with industry experts & mentors, get privileged access to events across the country, and participate in webinars and access to other resources on the innovation landscape in the country. Cash prizes of up to USD 700,000 (for driverless car challenge) and USD 300,000 (for solar power challenge) are rewarded for the development of winning innovations.

- **Ankur Capital Venture Fund:** Ankur Capital is a social venture fund that invests in start-up businesses (1-3 years of on ground operations) that impact low income communities in India. It supports inclusive models that can lead to transformations in these communities by providing financial and technical assistance with angel investment of up to Rs. 50 lacs. Beneficiaries are for-profit ventures, operating in agriculture and allied sectors; agri-tech, agri supply chain, distributed agri processes, IT for agriculture, animal husbandry, rural health & education and livelihoods.

- **Ennovent Circle:** The Ennovent Circle is an exclusive network of individual and institutional members, experts and mentors looking to invest and support for-profit companies making an impact on economically disadvantaged communities with sectoral focus on energy, water, healthcare and education. It renders an opportunity to showcase the enterprise in front of 20+ impact investors, provides access to diverse mentorship through renowned industry leaders, angel investors and entrepreneurs and service providers (CAs, legal assistance, audit, taxation).

C) Internet.org

Internet.org's Innovation Challenge's objective is to encourage the development of applications or online services that can create real value for the members of

'important communities'; namely women, students, farmers and migrant workers in India. Individuals, groups and organizations across the globe are eligible to participate in the event. The challenge is to create a working application, website or online service with the potential to benefit any of the four mentioned target groups. On the basis of a pre-defined criterion, a panel of industry experts shall evaluate the projects, rewarding 12 projects with cash prizes of up to USD 250,000.

D) Indian Institute for Human Settlements

The National Students Challenge[16] was a platform to bring together students from different academic levels; undergraduates, postgraduates and doctoral. The competition entails identifying an urban challenge and formulating a possible solution to the problem. 25 shortlisted teams will get the opportunity to present their idea in front of a distinguished jury. Top three projects are rewarded with cash prizes of up to Rs 3 lacs along with individual cash prizes for other participants. E) XPRIZE Global Learning is a competition that challenges teams from around the world to develop open source scalable software solutions that will enable children in developing countries to teach themselves basic reading, writing and arithmetic within the 18 month competition field-testing period. Participating teams get 18 months to develop their solutions after which a panel of third party judges will evaluate and select the top five competitions to proceed in the competition. Each of these five teams is awarded USD 1 million and proceeds to the field. Post field evaluation, the top performing team will be awarded with USD 15 million. F) Accenture India Partnering with Yahoo India, Accenture India launched the Innovation Jockeys program in 2012. The program is a search for India's best innovators; open to undergraduate, graduate and post graduate students around the country. With its reach across 1,000 colleges and universities, the challenge serves as a catalyst for technology innovation in India. Winners are rewarded with a trip to Accenture Technology Labs in China, Apple and Google Nexus products and an opportunity to be recruited by Accenture.

E) Xprize

Global Learning is a competition that challenges teams from around the world to develop open source scalable software solutions that will enable children in developing countries to teach themselves basic reading, writing and arithmetic within the 18 month competition field-testing period. Participating teams get 18 months to develop their solutions after which a panel of third party judges will evaluate and select the top five competitions to proceed in the competition. Each of these five teams is awarded USD 1 million and proceeds to the field. Post field evaluation, the top performing team will be awarded with USD 15 million.

F) Accenture India

Partnering with Yahoo India, Accenture India launched the Innovation Jockeys program in 2012. The program is a search for India's best innovators; open to undergraduate, graduate and post graduate students around the country. With its reach across 1,000 colleges and universities, the challenge serves as a catalyst for technology innovation in India. Winners are rewarded with a trip to Accenture Technology Labs in China, Apple and Google Nexus products and an opportunity to be recruited by Accenture.

[16]The National Students Challenge was last held in 2013.

3.2 Business Incubators in India

Business Incubators are the third category in entities promoting innovation. The following section offers an overview of the types of incubators functional in India along with the services offered and innovations supported by them.

Introduction and Services Rendered

Business incubators aid the development of start-ups and newly formed entrepreneurial firms, helping them in early stages of growth, by providing a range of targeted business and support services such as:

1. Infrastructure Support

- Office Space/Workstations
- Computers/Laptops and Internet Access
- Laboratory Facilities, specialized equipment
- Training/Conference Space

2. Funding and Investment Assistance

- Accounting and Financial Management Services
- Fund Raising
- Access to Angel Funds, Venture Capitalists
- Access to Grants/Loans
- In-house Venture Funds
- Crowd funding Services

3. Networking Assistance

- Access to Network of Mentors
- Linkages to Strategic Partners
- Network of external Service Providers

4. Business Services

- Strategy and Business Plan Development
- Marketing Assistance

- IP Protection and Licensing Assistance
- Legal Assistance
- Regulatory Compliance
- Commercialization Assistance

5. Mentoring and Education Services

- Training Programs and Workshops
- Advisory Services
- Access to Resource Libraries and Databases
- Commercialization Seminars, Workshops and Conference

Business Incubators in India: Current Scenario

Business Incubators[17] in India have incubated more than 2,000 entrepreneurial ventures, with over 950 having entered the market. The potential to develop and train aspiring entrepreneurs is huge, with a capacity to physically incubate 1,000 hi-technology ventures. Annually, close to 15,000 start-ups approach incubators for mentorship and assistance.

For the year 2013, incubatee and graduate companies registered a combined turnover of approximately Rs. 1,500 crores and employed more than 32,000 people. At present, there are more than 120 Technology Business Incubators (TBI; government supported business incubators) in the country, from which 500 small businesses graduate annually. The areas of engagement of NSTEDB supported TBI's are science and technology inclined, ICT, biotechnology, nano-materials, instrumentation, manufacturing, engineering, media and infotainment, healthcare and pharmaceuticals, agriculture and allied activities, energy and environment. Survival rate of companies incubated in these TBIs is 70-80 per cent.

An emergent category of business incubators gaining prominence in India are corporate business incubators. These are a recent development and were introduced in the Indian innovation space in the early 2000s (post the dot com bubble). Notable examples include **91 Springboard** and **GHV Accelerator, DLabs, HealthStart and Applyifi.**

[17]As per NSTEDB Report 2013.

1. 91 Springboard	
Year of Establishment	2012
Fields and Stages	91 Springboard is a private incubator that provides infrastructure to start-ups and a number of service providers to work towards building their business together. It hosts start-ups as well as free lancers in the field of design, PR, digital marketing, development, accounting, HR, legal and administrative support. It offers incubation program to start-up still in the product development or product market fit testing phase
Fee	It operates purely on rental basis and no equity is involved
Capacity per Year	It has an incubation capacity of 100 start-ups depending on the size of start-up.
Average Period	The average incubation period is about one and a half years
Evaluation Process	Online application form for the incubation program is available at the website. Apart from this reference and participation in events held by 91 Spring Board help the participants to get in touch with 91 Spring Board for their needs. A major criterion for inducting start-ups is the team background of the start-up. No other specific parameters are considered for evaluation. Not much filtration on the quality but the value, that individual start-up will bring to the start-up community, is considered.
Services Provided	a. **Funding:** 91 Springboard itself doesn't provide any funding but it has tie-ups with angel investors and venture capitalists. Start-ups are guided to these investors for their funding requirements. For early stage start-ups it can range anywhere between Rs. 5-20 lacs and Rs. 1 crore. b. **Mentorship:** Experienced entrepreneurs are present full time on site and work with start-ups on every aspect of their business to get to market and get initial traction. c. **Infrastructure:** 91 Springboard provides co-working space to the incubated companies, which is committed towards making the start-up journey easier and more fun through co-working. d. **Networks:** Connections shall be made to advisors, potential customers, strategic partners, and potential later round investors. e. **Informative classes:** 91 Spring Board organizes classes to keep the entrepreneurs up to date on management techniques and industry trends, informative talks by mentors and industry professionals, mixers events to help the start-ups build peer groups and networking within the start-up community.

2. GHV Accelerator	
Year of Establishment	2014
Fields and Stages	Green House Venture (GHV) is a sector agnostic accelerator, it supports start-ups in fields as diverse as healthcare, education, technology, consumer goods, food technology and e-commerce. GHV houses start-ups at pre-venture capital stage but only post-incubation. However, the firm's focus is on assisting technology enabled start-ups. Most of the start-ups inducted by GHV Accelerator are tech focussed innovations.
Capacity per Year	GHV has a residence capacity of 10 start-ups per year. Each start-up can get a seed funding up to $100,000 in exchange for equity up to 20 percent.
Average Period	Average period of acceleration is 10 months while the maximum induction time is 12 months.
Evaluation Process	Participant entrepreneurs are inducted through a variety of channels; the most common ones being member & mentor references and direct applications. GHV has its own criteria for evaluating start-ups at the pre-induction stage which is known as TEST- Proof of Concept (POC). TEST comprises the following components – Team composition, proven strong execution capability, highly scalable business model and technology based business model. POC looks for consistent revenue growth, repeat customers signifying confidence in product/service and market validation of the product.
Services Provided	The accelerator program provides the following offerings: a. Infrastructure Support b. Mentoring and Advisory services c. Product and Business Development d. Market Research e. Access to empanelled service providers
	Entrepreneurs are required to be resident at GHV once a month for a week to get mentored. Start-ups work in a controlled environment where specific functions like human resource, finance, market research are provided by a set of predefined vendors which are identified by GHV. The intention is to help companies ramp up growth, focus on scale, shorten time to get VC funded, and attract higher valuation. GHV also has more than 60 information sharing and dissemination partnerships with leading incubators, accelerators and angel networks namely; Amity TBI, 10,000 Start-ups and Indian Angel Network. The start-ups inducted in GHV Accelerator have created employment opportunities for more than 1.24 lac people. The two leading start-ups; My Taxi India (car rental service) and LazyLad (retail based mobile application) are employing 24,000 and 100,000 drivers & backup drivers and vendors respectively.

3. HealthStart	
Year of Establishment	2012
Fields and Stages	HealthStart primarily inducts start-ups working in the fields of healthcare namely – digital healthcare, mHealth, medtech, wellness and disease management and start-ups that increase access and affordability of healthcare services and products through innovative distribution and business models. As healthcare is an essential component of the social sector, most start-ups inducted in the program are social innovations with a focus on technology offering flexible, cost effective, easily accessible and efficient solutions.
Capacity per Year	A total of 5-6 start-ups are inducted in the accelerator program in a year
Average Period	The average incubation period is 5 months
Evaluation Process	Most start-ups apply directly or are referred by an acquaintance or team members; at times HealthStart's education and industry partners such as ISB Hyderabad and NASSCOM. The most important criteria for short listing at the preliminary level, is the prime areas of focus of the start-up. Other criteria attributed equal importance includes the product or service proposition, team background and technical and business expertise.
Services Provided	HealthStart Accelerator Program brings a unique opportunity for early stage healthcare entrepreneurs for getting funds, mentoring & access to global network. Healthstart does not offer physical incubation services or infrastructure support to its inductees. However, it does offer mentoring and advisory services, assistance with business development, networking assistance and access to external service providers including legal firms.
Employment potential	The employment generation potential for start-ups inducted in Healthstart is 10-15 employees per start-up

4. Applyifi	
Year of Establishment	2015
Fields and Stages	Applyifi is a private platform for entrepreneurs and early age start-ups to create comprehensive and elaborated online investor pitch decks. Start-ups can share their pitch deck with multiple investors/ incubators/ accelerators whether these investors/ incubators/ accelerators are registered on Applyifi or not. Start-ups are engaged with Applyifi based on their team background rather than the sector specification. Most of these start-ups are working in the technology sector.
Fee	Apart from the membership fee, no equity model is followed by Applyifi.
Capacity per Year	On an average10-12 start-ups are engaged annually
Average Period	The average engagement period is 1-3 months
Evaluation Process	Applicants use direct application methods as detailed on Applyifi's website. Start-ups are identified and reviewed thoroughly based on the compatibility of the start-up team and their technology and business expertise. Applyifi's detailed application form helps start-ups think through their business in detail, and that provides Applyifi the information that helps them shortlist high-potential start-ups which are likely to be of interest to the investor community. Further high-potential start-ups are shortlisted for one-on-one meetings or Skype calls, and a detailed assessment is done, similar to any investor group or venture capital. Based on the assessment, a 36-point score card is created providing Applyifi's view of the investment opportunity in that start-up.
Services Provided	Apart from mentoring and advisory services, Applyifi conducts a three-day workshop to help the start-ups with their business plan. These business plans are elaborate business models which are further presented to investors to raise investment for the start-up by Applyifi. Applyifi doesn't offer direct funding to the start-ups but creates an online platform for start-ups where they can present themselves and investors can decide where to invest their capital.

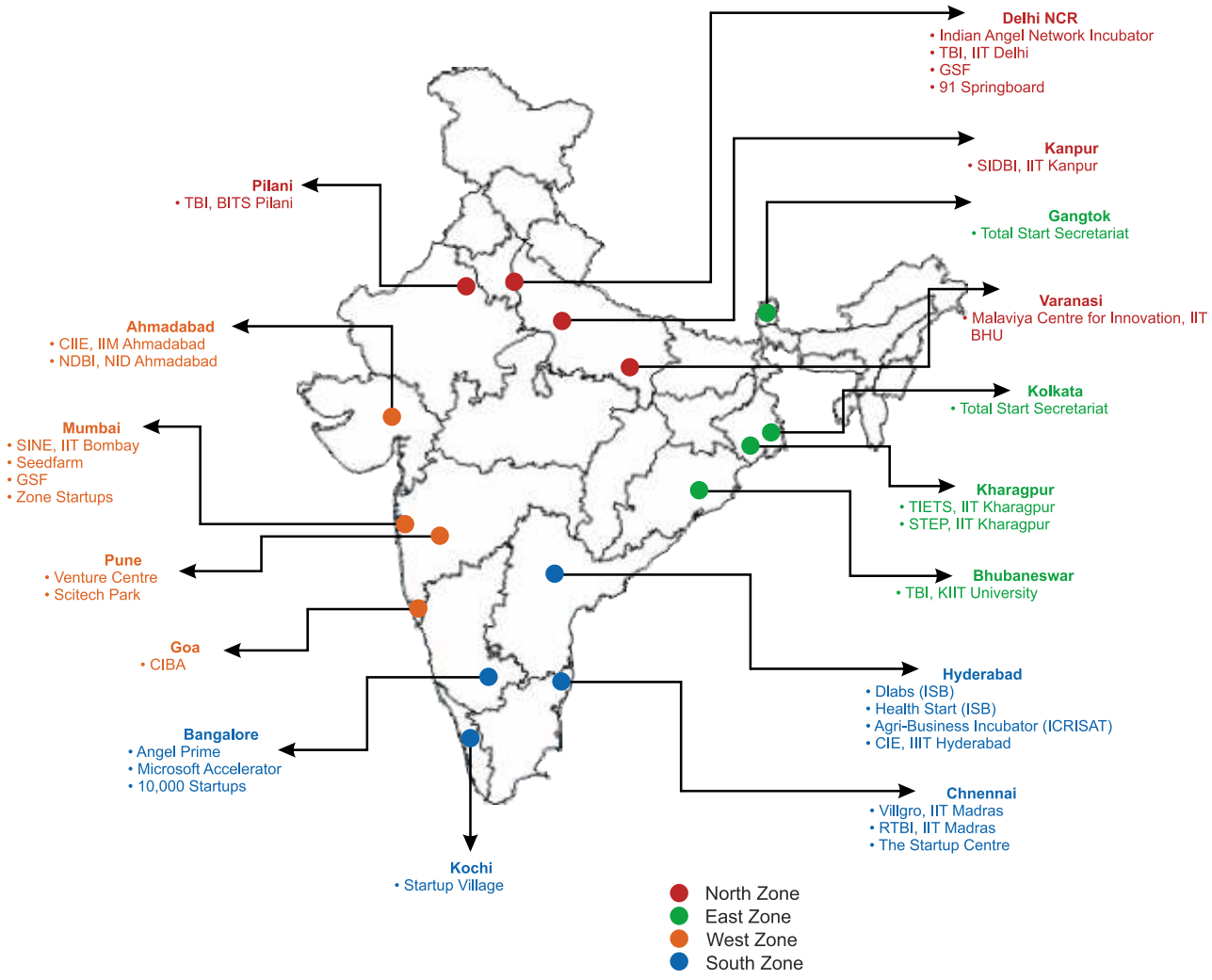
5. DLabs	
Year of Establishment	2014
Fields and Stages	DLabs has been set up by the Indian School of Business (ISB), at their Hyderabad campus, with the objective of strengthening entrepreneurship and fostering innovation among the young generation in India including its student and alumni community. They leverage an immersive and transformative Human-Centred Design (HCD) process to build the next generation of companies. Their initial focus area was healthcare and gradually, they are moving to other domains as well such as smart cities. The initial graduate start-ups included market aggregators for healthcare industry, start-ups working on post surgery/ discharge care, paediatric care, end to end ERP solutions, etc. These were spread across major cities like Gurgaon, Bangalore, Mumbai, Hyderabad, etc.
Fee	Dlabs does not charge fees from inductees but has some share in the equity.
Funding	Dlabs provides seed funding of Rs 20 lacs to each start-up which works with them to put their best foot forward and make the necessary connections for the next round of funding.
Average Period	The average accelerator program lasts for 5-6 months.
Evaluation Process	The start-ups have to fill in online application form providing an overview of their ideas. Applicants are shortlisted based on predefined conditions and interviewed. They have to then undergo a detailed second round of interview which is followed by voting to select the start-ups. The most important criterion for short listing at the preliminary level is the return on investment (ROI) potential. Other criteria which are equally important are the team background, their technical and business expertise and the product or service proposition.
Services Provided	They provide services such as funding for start-up, mentoring, and extensive hands-on support. Dlabs currently does not offer infrastructure support to its inductees but may provide assistance in future. It has an in-house interdisciplinary "SWAT" team to work with the inductees in an integrated and hands-on fashion to overcome challenges. DLabs also provides networking support to make introductions to potential beta customers, partners, and future investors and hiring additional talent. DLabs has an internal team of 7-8 business and design experts who conduct workshops and work closely with the start-ups. They provide continuous hand holding and perform deep-dive analysis to solve any issues. DLabs also introduces the inductees with mentors from across India. These may be strategic mentors to guide the start-ups on statistical level or specialist mentors to provide expert knowledge.

Geographic Location of Incubators

Business Incubators in India are spread across key metropolitan cities, tier 1, 2 and 3 cities and cities regarded as educational hubs as shown in **Figure 3**. Depicted below are 4 identified clusters or zones where the most active and established incubators are located. These 4 zones are:

North Zone	East Zone	West Zone	South Zone
• Delhi NCR • Kanpur • Varanasi • Pilani	• Kolkata • Kharagpur • Bhubaneswar • Gangtok	• Mumbai • Pune • Ahmadabad • Goa	• Chennai • Bangalore • Kochi • Hyderabad

Figure 3: Prominent Business Incubators in India



3.3 History of Incubation: The Case for India (1984-Present)

Science and Technology Entrepreneur Parks (STEP)

The concept of business incubation first gained importance in the early 1980s with the establishment of Science and Technology Entrepreneur Parks (STEP) by National Science and Technology Entrepreneurship Development Board (NSTEDB). The Ministry of Science and Technology initiated the STEP program in 1984 in collaboration with financial institutions such as IDBI, IFCI and ICICI. STEP has tried to foster linkages between academia, industry and R&D institutions to inculcate a culture of entrepreneurship and focus on self employment, training and job generation, and not on technology or high tech enterprises. STEPs promoted nearly 788 units of new businesses generating an annual turnover of around Rs 130 crores and employment for 5,000 persons. More than 100 new products and technologies have been developed by the STEP promoted entrepreneurs. This success has prompted the NSTEDB to consider alternative mechanisms that could further accelerate high technology venture creation.

Technology Business Incubators (TBI)

India's exposure to TBIs began in 1987 with three pilot projects set up in collaboration with the United Nations Fund for Science and Technology – BITS Pilani, Shriram Institute New Delhi and MITCON Pune. Of these, only MITCON survived beyond pilot stage after UN funding came to an end. The TBI program was successfully re-launched in the country as the economy began to stabilize in 2000. By 2004, 15 TBIs were set up, mostly in institutes of excellence such as IIM-Ahmadabad, IIT-Bombay, Vellore Institute of Technology, BITS Pilani etc. At present there are more than 120 TBIs in the country, from which 500 small businesses graduate annually. According to NSTEDB guidelines, the legal entity for TBIs may be in the form of a not-for-profit registered society or trust, or a Section 25 company. Legal status of the TBI can be decided by the host institute.

Typically, TBIs induct incubatees using a selection policy, which varies depending on the overall objectives and mission of the incubator. However, the standard selection process consists of submission of a business plan or proposal outlining the agenda, product details and the functional model. This proposal is then evaluated by a domain expert, post which applicants are shortlisted for the program. This is the general evaluation process, extended across major business incubators in the country. Enterprises are inducted for in-house incubator programs, for a maximum period of three years.

Other Initiatives

A number of Central government agencies are involved in the promotion of business incubators in India. Chiefly, the Department of Science and Technology and the Department of Scientific and Industrial Research are encouraging science and technology intensive innovations. A significant step in this regard has been the establishment of The National Innovation Foundation, to offer institutional support for innovative ventures and activities. Several national flagship programs and policies have been launched to promote innovation and entrepreneurship activities namely;

- Technology Promotion, Development and Utilization Program (TPDU)
- Technology Development and Innovation Program (TDIP)
- Technology Development and Demonstration Program (TDDP)
- Technopreneur Promotion Program (TePP)
- Science and Technology Policy
- National Innovation Policy
- Special Innovation Zones

These initiatives are supported by banks and financial institutions such as:

IDBI	• ICICI Venture Funds
SIDBI	• TFCI
IFCI Ltd	• LIC
IIBI	• GIC
IVCF	• UTI

The initiatives of the Department of Science and Technology along with programs such as Entrepreneurship Development Cells, Innovation and Entrepreneurship Development Cells, STEPs and Technology Business Incubators in the new millennium have been proven successful. Salient features of these initiatives include:

- Incubation funds provide seed money to entrepreneurs
- Tax exemptions for services offered by TBIs
- Priorities for incubated enterprises in financial markets

Furthermore, the launch of TBIs in collaboration with other premier private and government educational institutes and the dot com bubble/ crash have been instrumental in laying the foundation for a culture of support to small businesses and new entrepreneurial ventures.

3.4 Need for Business Incubators

The basic need for business incubators stems from the rationale behind their establishment – support for upcoming, inexperienced entrepreneurs. Most entrepreneurs inducted in incubation programs are first timers and may be relatively naive in terms of industrial exposure and experience. Projects developed by such start-ups are still in their nascence. In such cases, an incubator supplements as an organization offering a range of essential services, vital for the company and the product's overall development.

Incubator programs have multi-fold benefits for all stakeholders involved:

1. For a Start-up:

- Creation of a protective environment for doing business and reduction of entry risk
- Reduced early stage operational costs
- Technology development
- Opportunity for industrial collaboration
- Opportunity to network and make strategic partnerships
- Skill development

2. For Governments:

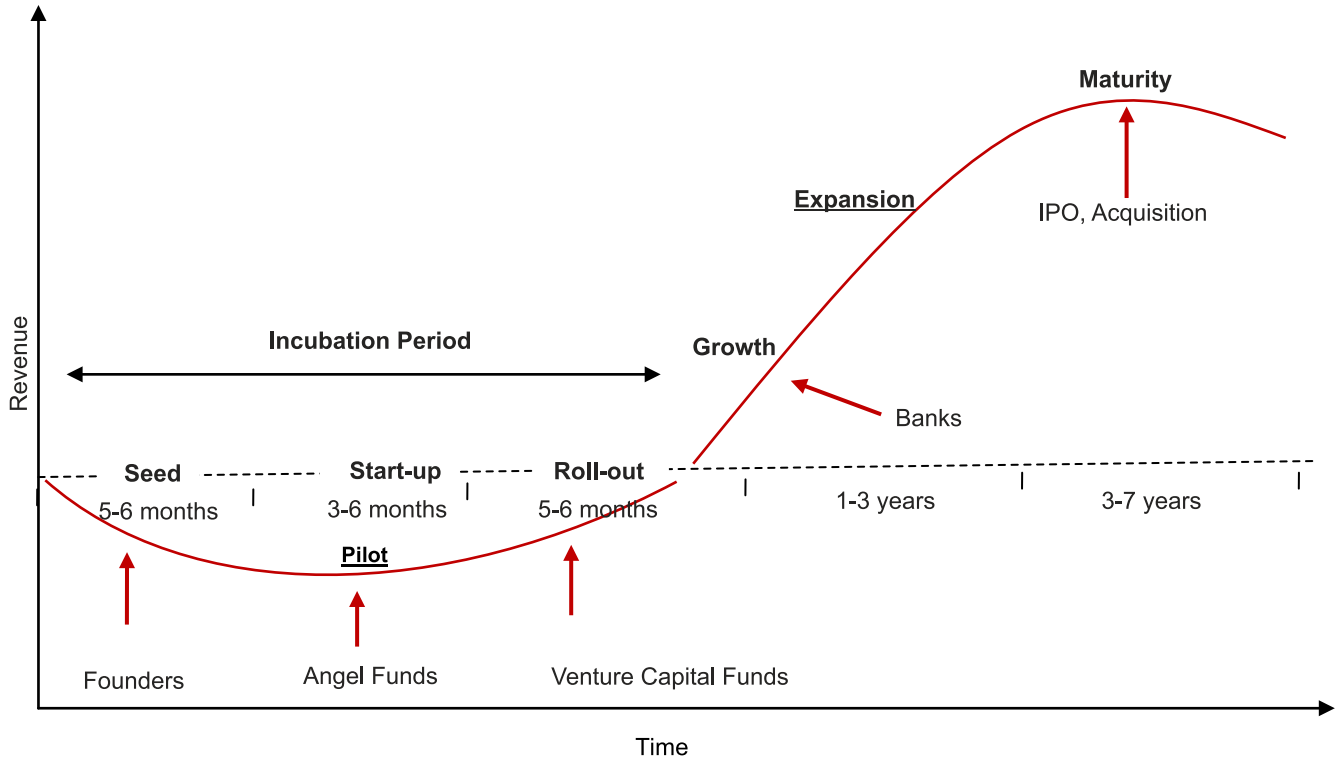
- Promotion of regional development
- Employment generation
- Opportunity to overcome market failures

3. For Universities/ Research Institutes:

- Strengthened industry-academia linkages
- Research commercialization
- Opportunities for faculty/ students to enhance capabilities

3.5 Growth Stages and Funding Sources: From Seed to Maturity

Figure 4



The figure above depicts the **five crucial stages** of growth and transformation, from seed (idea) to an enterprise or firm. These stages are:

1. Seed Stage
2. Start-up Stage
3. Roll out Stage
4. Growth Stage
5. Maturity Stage

Stage 1 – Seed Stage

- **Focus:** The seed stage is the first stage in the lifecycle of a start-up or new entrepreneurial venture. At this stage the business is just an innovative thought or a smart business idea which has been put down on paper but not developed completely. This stage is marked by business planning, creating a product/ service proposition and the search for professional advisors. The main concern for the innovator at this stage is to conceive an actionable, marketable prototype of the product.
- **Funding:** As there is no access to external funding sources, the entrepreneur is compelled to depend on own sources/ friends and family for funding. Nil/ Negligible revenue generated at this stage.
- **Timeline:** 5-6 Months

Stage 2 – Start up Stage

- **Focus:** At this stage, the entrepreneur has developed a comprehensive plan of action and a prototype of the services s/ he proposes to offer. Marketing activities are implemented to establish

customer base and market presence. Pilot tests may also be conducted to check consumers' acceptance of the product. This is a testing and feedback phase which can have a significant impact on business. This is a deciding stage and has crucial implications regarding the viability of the initiative. It is also at this stage that start-ups come in contact with incubators and are inducted into an incubation/ acceleration program depending on the stage of growth their product or innovation happens to be in.

- **Funding:** The initial funding to the entrepreneur is supported by angel funds. This may be a one-time injection with lenient terms of lending as the motivation is helping an upcoming business in need and not profit. Very little revenue generated at this stage.
- **Timeline:** 3-6 Months

Stage 3 – Roll out Stage

- **Focus:** At this stage the innovative product is introduced in the market, preceded by a strong marketing campaign. The incubation phase is nearly complete, with the entrepreneur preparing to enter the market on his or her own.
- **Funding:** Venture Capitalists fund the project at this stage, seeing tremendous growth potential and expecting higher returns on investment. Little revenue generated at this stage.
- **Timeline:** 5-6 Months

Stage 4 – Growth Stage

- **Focus –** At this stage, business is on the path of upward growth. Emphasis is on running the business formally, scaling up operations, competing effectively with competition and expanding customer base and sales. Business becomes self-sufficient and can be sustained with little or no help from external mentors or advisors. Biggest challenge at this stage is to effectively manage company resources and come up with new business ideas to sustain this growth. Though profits are strong in this phase, competition is resurfacing.
- **Funding:** The funding is largely supported by banks and internal sources. Revenue starts pouring in and profits are larger, in case of a successful venture.
- **Timeline:** 1-3 Years

Stage 5– Maturity Stage

- **Focus:** Maturity stage is characterised by a new period of growth and continuous expansion. The business has an established, larger market presence. Firm's focus has changed from horizontal to vertical expansion. Sales growth is not explosive but manageable. The firm has a loyal customer base and has ventured into new markets. Significant measures are undertaken to enhance productivity and improve existing capabilities. It is at this stage that some firms decide to go public through an IPO (Initial Public Offering) or are merged/ acquired by larger corporations.
- **Funding:** The funding is largely supported by banks and new investors. Revenue and profits are greater than before.
- **Timeline:** 3-7 Years

3.6 Types of Incubators

The table 3 below is a comparative representation of various types of functional incubators in India. Though significant overlaps were seen for areas under focus, incubators were found to differ greatly in terms of the goals/ intent behind launching incubatory initiatives.

Table 3

S. No.	Type	Description	Expected Goals	Focus Areas	Examples
1	Independently Founded	• Founded and managed by a team of independent entrepreneurs/ experts with substantial industry experience • Majority of such incubators are headed by Corporate groups	• Winning enterprises • Profits/ Equity • High portfolio returns	• Corporate Communications • Mobile Technology • IT Hardware • Retail • Ecommerce • Travel and Tourism • Financial Services	• 5ideas • 91 Springboard • Khosla Labs • 500 Start-ups
2	Institute/ Organization Sponsored	• Sponsored by a parent institute or organization with considerable market presence and domain expertise • May be supported by an Educational Institute or a Private Organization	• Innovation • Faculty-student involvement • Research Commercial-ization • Profits/ Equity	• Healthcare • Mobile Technology • Education • Construction • Nanotechnology • Energy	• NSRCEL, IIM Bangalore • 10,000 Start-ups • Tlabs • Healthstart (ISB)
3	Government Supported	• Sanctioned by government as a part of statutory mandates • Led by a University and/or Research Organizations	• Investment • Employment • Social benefits • Innovation • Research Commercialzation	• Healthcare • Education • Aerospace • Defence • Embedded Systems • VLSI • Green Technology	• IIT Delhi Technology Business Incubator • BITS Pilani TBI • Shriram Institute for Industrial Research • SciTech Park

1. Independently founded incubators are managed and supported by a group of individuals, whose primary engagement may not be incubation or mentoring small businesses. Such incubators have recently emerged, post the Indian IT and ITES boom. Majority of these incubators are supported by those who have significant experience in running small businesses. The intent behind rendering support to start-ups for such incubators is the desire to make profits and earn high returns on investment.

2. Institution/Organization sponsored incubators are initiatives of an educational or professional organization with considerable market presence. The intent behind setting up incubators is not only profits but also popularizing innovation and research oriented activities.

3. Government supported incubators have been sanctioned as a part of Central/ State government's policy initiatives or programs. Intent behind such incubators is generation of employment, promotion of innovation and commercialization of research.

3.7 Focus Areas

Table 4 below depicts the key focus areas along with dominant players for each category of incubators:

Table 4

S. No.	Category	Functional Areas	Example Incubators		
			Independently Founded	Institute Supported	Government Sponsored
1	Information and Communication Technology	• Mobile Technology • Ecommerce Telecommunications • SAAS • IT Hardware, Products and Services • Internet of Things • Design and UX • Social Media • Gaming and Animation	• 91 Springboard • GSF Accelerator • 5Ideas	• 10,000 Start-ups • Microsoft Accelerator	• TBI, BITS Pilani • CIIE, IIM Ahmadabad • Start-up Village, Kochi
2	Science, Engineering and Energy	• Aerospace • Biotechnology • Energy • Renewable Energy/Clean Technology • Food Technology	—	—	• CIIE, IIM Ahmadabad • TBI, IIT Delhi • Villgro
3	Knowledge Services and Analytics	• KPO/BPO Services • Analytics • Big Data • Consulting	• 5 Ideas	• IAN Incubator • Microsoft Accelerator	• Start-up Village, Kochi
4	Banking and Financial Services	• Wealth Management • Micro funding and micro credit • Bit –coins • Payments and Financial Services • Investment Research	• 500 Start ups • 91 Springboard	—	• Villgro

5	Electronics and Automobiles	• Embedded Systems and VLSI Design • Geographic Information System • Micro Controllers • Micro-electromechanical devices • Process Automation • Automobiles and Auto components • Robotics	—	—	• TBI, IIT Delhi • TBI, BITS Pilani • Start-up Village, Kochi • Amity TBI
6	Healthcare and Pharmaceutical Sciences	• Mobile Health • Healthcare Software Tools • Diagnostics • Wearable Devices • Disease Management • Remote Monitoring • Clinical Research • Pharmaceuticals	—	—	• Dlabs • Health Start • TBI, BITS Pilani • Villgro • Amity TBI
7	Media, Marketing and Communication	• Ad Tech • Media • Corporate Communication • Event Promotion	• 91 Springboard	• Microsoft Accelerator	• Start-up Village, Kochi
8	Agriculture and Agribusiness	• Agriculture • Bio-products and Bio-pesticides • Organic Retail Chains • Transgenic Vegetables	—	—	• Agribusiness - ICRISAT • Villgro
9	Infrastructure and Architecture	• Construction and Interiors • Infrastructure	• 91 Springboard	—	—
10	Education and Social	• Education • Urban Parenting • Social Impact	• 5 Ideas	• IAN Incubator	• Villgro
11	Others	• Defence • Travel and Tourism • Retail and Textiles	• 91 Springboard	• IAN Incubator	—

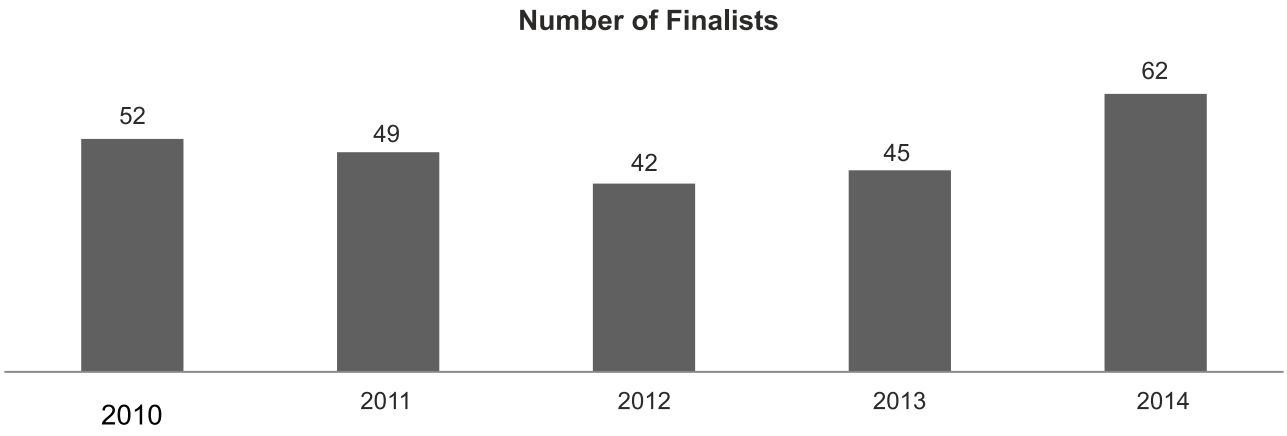
4. THE i3 CHALLENGE JOURNEY

4.1 i3 Over the Years

Between 2009 and 2015, the challenge has received over 5,449 of entries. Applicants include students, researchers, scientists, academicians, entrepreneurs, MSMEs and professionals. I3 has had an extensive impact on the Indian innovation sphere with entries coming in from metropolitan cities (Delhi, Mumbai, Kolkata, Chennai), tier 1, 2 and 3 cities (Patna, Indore, Madurai, Trivandrum, Shillong) and remote towns and cities (Karur, Raigad, 24 Paraganas, Yamuna Nagar).

Figure 5 below depicts the year-wise total number of innovations selected for the national fair. ves.

Figure 5



4.2 Professional Background of Participants

The professional background of participants has been diverse with applicants applying independently as well as in groups; as representatives of educational or professional institutions. Organizations which have been represented in the past:

1. Institute of Microbial Technology (CSIR), Chandigarh
2. IIT Kharagpur
3. Indian Council of Medical Research, New Delhi
4. National Aluminium Company Limited (NALCO)
5. Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC)
6. Tata Consultancy Services
7. Govt. Rajaji Hospital, Madurai
8. NIT Goa
9. Kerala Public School Trust
10. Vellamal College of Engineering and Technology

4.3 Focus Areas

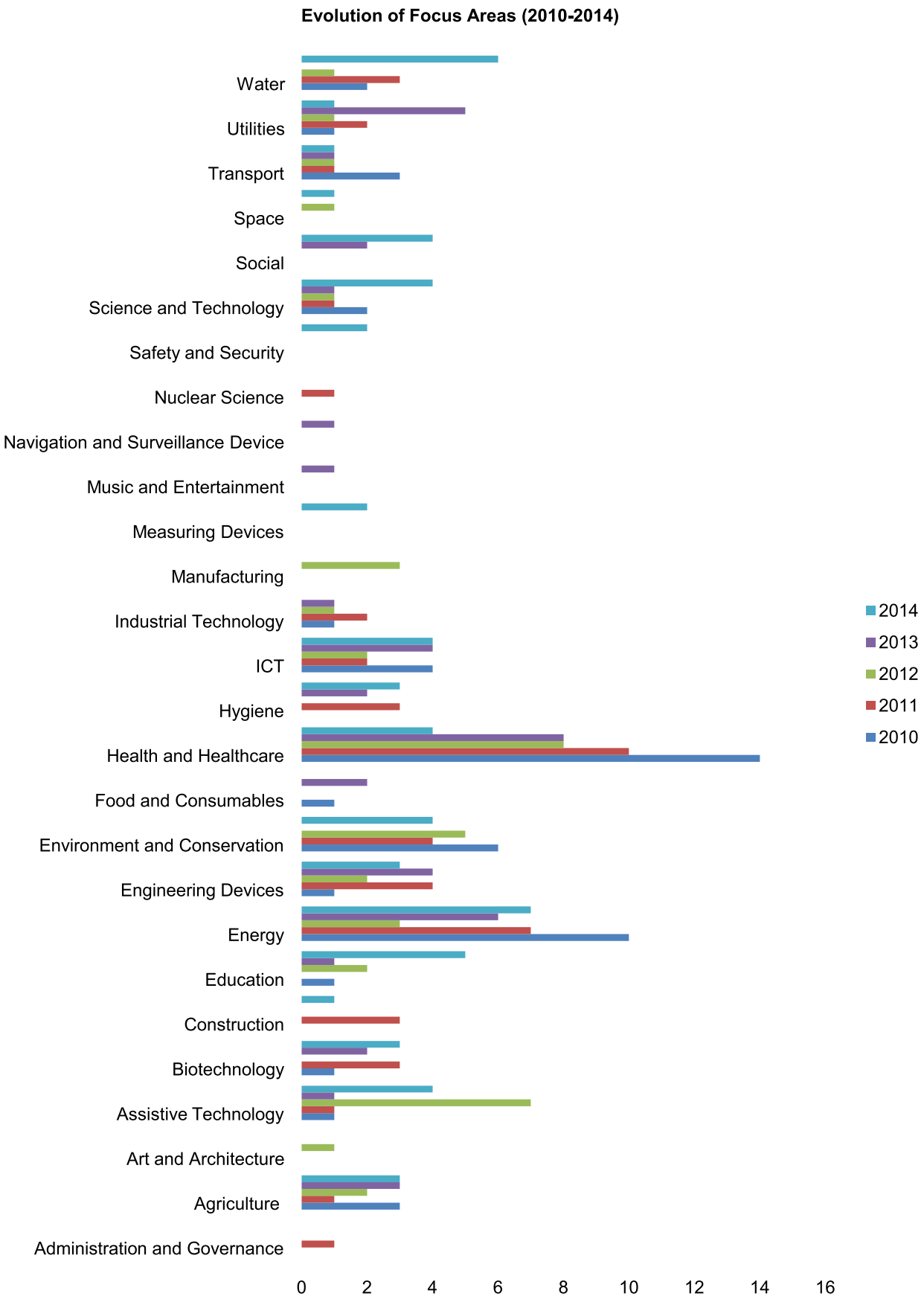
The focus areas of engagement have evolved over the years. The first year of the competition (2010) saw 15 categories of innovation which extended to 20 distinct categories by the second year itself. Cumulatively, 27 categories of focus areas have been identified:

Focus Areas

1. Administration and Governance
2. Agriculture
3. Art and Architecture
4. Assistive Technology
5. Biotechnology
6. Construction
7. Education
8. Energy
9. Engineering Devices
10. Environment and Conservation
11. Food and Consumables
12. Health and Healthcare
13. Hygiene
14. Information and communication technology(ICT)
15. Industrial Technology
16. Manufacturing
17. Measuring Devices
18. Music and Entertainment
19. Navigation and Surveillance Device
20. Nuclear Science
21. Safety and Security
22. Science and Technology
23. Social
24. Space
25. Transport
26. Utilities
27. Water

As depicted in figure 6, some categories of innovations have consistently made it to the final level of the competition. These include – health and healthcare, energy, environment and conservation, assistive technology, education and utilities. I3 has been a springboard for many novel projects, especially for areas that have not been addressed by other initiatives, such as navigation and surveillance devices, safety and security devices, smart mobility and assistive technology for the disabled and elderly. It is interesting to note that most awarded innovations had a social purpose and posed greater benefits for the community, thereby transforming the challenge from an innovation competition to a medium for solving societal problems.

Figure 6


Evolution of Focus Areas (2010-2014)
Water
Utilities
Transport
Space
Social
Science and Technology
Safety and Security
Nuclear Science
Navigation and Surveillance Device
Music and Entertainment
Measuring Devices
Manufacturing
Industrial Technology
ICT
Hygiene
Health and Healthcare
Food and Consumables
Environment and Conservation
Engineering Devices
Energy
Education
Construction
Biotechnology
Assistive Technology
Art and Architecture
Agriculture
Administration and Governance
2014
2013
2012
2011
2010
0
2
4
6
8
10
12
14
16

4.4 Triumphs and Accomplishments

Winners of past three years (2012-14) were interviewed to understand the current status of their innovation in terms of commercialisation and application in the real world. This exercise was held to gain in-depth insights on the winning innovations. Innovators were asked to share their motivation behind their innovation, its working principle, scope in the future and the challenges faced by them to take their innovation to next level. A total of 10 previous winners were interviewed with details mentioned in **table 5**.

Table 5

S. No.	Innovation	Innovators	Year of Winning	Organization/ start-up	Secured funding	Commercialisation of the innovation
1	Surface Water Velocity Driven Hydrokinetic Turbine – VARUN III	Narayan Bhardwaj, BalRam Bhardwaj	2014	Maclec Technical Project Lab Pvt Ltd	☒	☑
2	FundaSlate – an educational tablet	Paul Singh Kalra, Ranjod Kalra	2014	Stemfunda Education Inc	☑	☑
3	SHRAVAN – the robotic staircase climber for senior citizens	Adiv Shah, Harsh Bhatt, Sabhya Sehgal, Rahesh Saraf, Jeet Shah, Adesh Suri	2014	☒*	☒*	☒*
				Being students, innovators have decided not to commercialise their innovation but they are working towards making a working prototype		
4	Samay Sancharak – Braille enabled wristwatch and cell phone for blind people	Hitarth Narsi Patel	2014	Extreme Engineering Research Project Group	☑	☑
5	Internet enabled Electrical Switch	Syam Madanapalli	2013	iRam Technologies	☑	☑
6	Super-efficient ceiling fans – Super Fan	Sundar Muruganandhan	2013	Versa Drives Private Limited	☑	☑
7	Novel bacteriophage derived anti-staphylococcal protein	Dr. Janakiraman Ramachandran	2013	GangaGen Biotechnologies Pvt. Ltd.	☑	☑
8	Digital Location System (DLS)	Shrikant Kunden	2012	iZon Technologies Pvt. Ltd	☒	☑
9	A device to trap particulate matter from engine exhaust	Adess Singh, RDS Tiwana	2012	☒	☒	☒
10	Intelligent Automobile Software	Srinivas Dhanabalan	2012	Matric Pvt Ltd	☑	☑

☑ Yes ☒ No ☑ In progress ☒ Not applicable

The professional background of innovators is diverse including higher education students, graduates, businessman, entrepreneurs etc. All the innovators are working towards improving and commercializing their innovations. Major challenges faced by the innovators are raising the required funds for commercialisation and creating awareness about their product among the common people. To understand all the aspects related to their innovators, the detailed profiles are mentioned below:

Year of Winning	2014
Innovation	**Surface Water Velocity Driven Hydrokinetic Turbine – VARUN III**
Innovators	Narayan Bhardwaj, BalRam Bhardwaj
Educational Qualifications	Narayan is a graduate in commerce, with a diploma in automobile and MBA-Marketing. BalRam has completed B.Sc and M.Sc in Microbiology from Holkar Science College, Indore and is currently pursuing M.Tech Biotechnology from Kurukshetra University.
Organization's/Start-ups' Name	Maclec Technical Project Laboratory Private Limited
Professional Background	For the past 10 years, the Bhardwajs are working as freelance engineering service providers and R&D guides for government, private institutes and individual clients. In 2004, at the age of 16 years Narayan was awarded as a young innovator at a state level science competition, thereafter he started his journey as an innovator. In 2010, they established a workshop cum laboratory in New Delhi which is serving as a single multi-dimensional platform for professionals, students and societies who have ideas but do not have the means to develop them in actuality. So far, they have completed more than 10,000 projects for various professional organizations. They have also developed many innovative ideas, prototypes & pilot scale projects in the field of non conventional energy generation. The brothers have also filed many patents which have already been published and are, now, in their final examination phase.
Motivation behind Innovation	Hailing from a family of farmers, the brothers had experienced the plight of farmers, struggling to deploy diesel generators to draw water from canals because of power supply shortages. Most irrigation canals have flowing water of adequate velocity, yet due to lack of sufficient technological advancements, farmers are forced to use diesel generators which increase costs along with the burden of debt on farmers. The situation is believed to be even worse in remote villages and towns. The predicament of farmers motivated Narayan and BalRam to develop st ate of the art alternative, green technology which can pump water from water bodies, along with lighting houses.
The Innovation – Description and Working principle	Kinetic energy in any flowing water body is an inevitable phenomenon which is unfortunately going waste due to absence of any possible technological advancement in the field of kinetic hydro power generation. For developing countries like India where majority of population is engaged in agriculture and allied sectors, VARUN III provides a cheap and sustainable source of non-conventional energy through utilization of every source of running water including domestic, industrial waste water and sewage water flow. The proposed system is directly driven by kinetic energy present abundantly in constantly flowing artificial or natural water bodies without developing any-mega structure such as dams.The design is quite simple, easy to manufacture, inexpensive and low maintenance. VARUN III is a floating type turbine which is suited to be deployed in any flowing water body with ease with the potential to scale up up to megawatts. As per their survey, the innovation has the capacity to generate 2000 MW alone from the flow of the Ganges in Uttarakhand. The project has been pilot tested and evaluated under the guidance of Dr RP Saini, Alternate Hydro Energy Centre, and IIT Roorkee.

Rewards and Benefits Received	The Bhardwajs invested the entire cash prize received from the I3 Challenge in scaling up their winning project, VARUN – III. They are currently in talks with Indian Angel Network (IAN) for additional funding and commercialization support.
Other Projects	Apart from VARUN III, the Bhardwajs have developed situation and site specific hydrokinetic turbines VARUN I, VARUN II and VARUN IV. They are also working on a project to enhance efficiency and reduce cost & size of solar panels.
Challenges faced in current innovation	Major challenges the Bhardwajs are currently facing are getting additional funds and commercializing the product further.

Year of Winning	**2014**
Innovation	**FundaSlate – an educational tablet**
Innovators	Paul Singh Kalra and Ranjod Kalra
Educational Qualifications	Mr Paul Singh Kalra is a Masters in Electrical Engineering from the prestigious IIT Kharagpur and MBA. He is retired as a Professional Engineer in California, USA.
Organization's/Start up's Name	Stemfunda Education Inc
Professional Background	Mr Paul Singh has been associated with several reputed companies in USA; namely Siemens, Westinghouse Electrics, General Electric, Bechtel and Schneider Engineers.
Motivation behind Innovation	To provide teaching and learning resources in STEM (Science, Technology, Engineering and Mathematics) subjects. The tuition industry in India is worth Rs 10,000 crores. With this tablet in hand, students will have access to several thousand problems and solutions and need not go to tuition centres.
The Innovation – Description and Working principle	FundaSlate is a 9 inch educational tablet loaded with 10,000 problems and solutions for individualized learning and teaching Maths, Science and Economics. Topics covered include Algebra, Trigonometry, Geometry, Pre calculus, Physics, Chemistry, Biology, Computer Science, Calculus, Statistics and Economics. Each subject is divided into 50 chapters with 1,000 problems and solutions and has 10,000 hyperlinks to find and locate desired problems and navigate between subjects, chapters and problems. There is a FIND function to locate problems by keyword. FundaSlate is self contained and does not require access to the internet. FundaSlate can literally revolutionize the teaching of Math and Science in schools and colleges. In class, each student can work on a different problem and get help from the teacher individually. If the teacher wants to explain a particular problem to all the students, the problem can be displayed on a flat screen television with a HDMI cable and students can follow the problem on the tablet. There are plans to incorporate additional subjects in FundaSlate including Mechanics, Advanced Calculus, Organic Chemistry, Physical Chemistry, Differential Equations, Complex Variables, Linear Algebra, Finite Discrete Math, Numeric Analysis, Electric Circuits, Electronics, Technical Design Graphics, Optics and Genetics. This will add another 15,000 problems and solutions to the tablet, suitable for engineering and science students. FundaSlate is in the prototype stage at the moment and initial marketing is underway. There is no limit to the kind of revenue such an innovation can generate, both in monetary terms and as social benefits for the society.
Rewards and Benefits Received	Mr. Singh received cash prizes and certificates from CII after winning the competition. Mr. Singh hasn't approached any incubators or angel investors as the idea is self-funded.

Other Projects	Currently, the Kalras are working on expanding the scope of the innovation to include other technology and engineering subjects in the tablet. They would be approaching schools soon to encourage adoption of the FundaSlate tablet in classrooms by students and teachers alike.
Challenges faced in current innovation	Though the Kalras haven't faced any major hurdles in developing and testing their innovation. Stiff competition in the form of tuition centres and teachers pose challenges.

Year of Winning	**2014**
Innovation	**SHRAVAN – the robotic staircase climber for senior citizens**
Innovators	Team Robosapiens; a team of high school students-cum-innovators ▪ Aadiv Shah – 15 years – JamnabaiNarsee School ▪ Harsh Bhatt – 16 years – JamnabaiNarsee School ▪ Sabhya Sehgal – 16 years – JamnabaiNarsee School ▪ RaheshSaraf – 13 years – JamnabaiNarsee School ▪ Jeet Shah – 16 years – JamnabaiNarsee School ▪ Adesh Suri – 15 years – JamnabaiNarsee School
Educational Qualifications	Standard 10th ICSE
Organization's/Start up's Name	No organization formed yet as being students, innovators have decided not to commercialise their innovation.
Professional Background	Students
Motivation behind Innovation	We thought of this idea when we saw our own grandparents finding it difficult to climb even a small flight of stairs. This made us feel that we must do something for them as this problem restricted their day-to-day movements. We placed ourselves in their shoes and realized this problem needed to be tackled and a simple solution had to be made.
The Innovation – Description and Working principle	SHRAVAN is a fully autonomous, safe, stable, user friendly and cost effective stair climbing wheelchair. It consists of a 2 main parts- the wheelchair and the stair climbing mechanism. The stair climbing mechanism is located below the wheelchair. Shravan can climb and descend any kind of stairs irrespective of step height and width, which is possible because we are using ultrasonic sensors to detect the same. Unlike the other models available in the market, the wheelchair at all times remains horizontal which makes the user comfortable. Team Robosapiens has applied for a patent for the innovation.
Rewards and Benefits Received	Robosapiens received Young Innovator Award and certificates. As they are students, they did not approach any incubators or angel funds.
Other Projects	Members of Team Robosapiens are individually working on several projects which are as follows; ▪ Aadiv & Adesh: a project which aims to cleanse the air (of SPM) and reduce pollution near traffic signals. ▪ Aadiv:a project which harnesses the kinetic energy of the flowing water in canals to produce electricity. ▪ Rahesh:Games to help children with Down's syndrome speak more intelligibly.

Challenges faced in current innovation	The team plans to scale up the innovation by making prototypes for 10 kg, 50 kg and finally 125 kg. The major challenge is to reduce the number of servo motors from 6 to 3-4. This will help us reduce the cost. The current design cannot tackle spiral stairs and the team is working to solve that problem.

Year of Winning	**2014**
Innovation	**Samay Sancharak – Braille enabled wristwatch and cell phone for blind people**
Innovators	Hitarth Narsi Patel
Educational Qualifications	Currently pursuing Masters in Electronics and Telecommunication Engineering
Organization's/Start up's Name	Extreme Engineering Research Project Group
Professional Background	EERGP is an organization devoted to developing social projects along with helping students to develop social projects for free. Hitarth has been involved with EERGP for the past 4 years.
Motivation behind Innovation	The difficulties faced by their blind friends prompted Hitarth and EERGP to develop an assistive, alternative communication technology for the visually impaired.
The Innovation – Description and Working principle	Tremendous growth in digital world has changed human lives. More and more efficient and effective digital applications initiatives taken by governments across the globe will make great impact on next generation with experiencing more and more digitization. Current uses of mobile phones along with novel wearable devices demonstrate the same. There is a great need to extend various features provided by cell phones and other digital devices for the visually impaired. To achieve this, EERGP has created a novel mobile phone integrated with wearable watch design which shall act as an essential handled device for the blind and can be used for managing call, SMS, etc. effectively. Proposed SANCHARAK (a cell phone for the blind) and wearable device SAMAY (smart Braille enabled wrist watch for blind) have been developed after rigorous surveys followed by feedback on requirements from several blind organizations. They are demonstrated using of buzzer, QWERTY keyboard, ICE calling, alarm facility, GPS location tracking, battery level indication, network level indication etc. with Braille language support. In addition to the regular functions of a watch; SMS, call and other notifications being displayed on SAMAY with integration of novel technology of SANCHARAK shall make a visually impaired person work more efficiently, since both devices communicate with each other remotely. We strongly believe that use of these smart features will contribute at large in increasing work efficiency exponentially and help society at large. Preliminary results are very much encouraging and highly appreciated by intellectuals, various agencies, NGOs, research community, study groups, and prospective users. The devices have already been pilot tested at the National Association for the Blind at Worli, Mumbai and the feedback was very positive.

Rewards and Benefits Received	Certificates and Trophy
Other Projects	Hitarth is currently working to develop smart watch calculators and eBooks for the visually impaired. He is also working on creating GPRS and whatsapp facility for SAMAY SANCHARAK.
Challenges faced in current innovation	EERGP is currently searching for alternatives for solenoids to make phone display more compact and less costly.

Year of Winning	**2013**
Innovation	**Internet enabled Electrical Switch**
Innovators	Syam Madanapalli
Educational Qualifications	B.Tech, Electronics and Communication Engineering, NIT Warangal
Organization's/Start up's Name	iRam Technologies
Professional Background	Mr. Madanapalli has 10 years of working experience in Electronics and Communication domain with organizations like Ordyn Technologies, Samsung, Lightstand Communication and Metro Optix. Also, a member of IEEE Bangalore chapter and IPv6 forum India. He has been working as an entrepreneur in the technology domain since the past 7 years.
Motivation behind Innovation	Energy conservation is everybody's responsibility. Intelligent lighting and appliance control allow the energy savings up to 30 per cent. To achieve energy conservation in countries like India, the solution must be affordable and easy to use for most of the citizens without technology complexity. iRam Technologies invented an IPv6 based Internet enabled Electrical Switch which is the most advanced electrical switch in the world that fits into the existing Indian electrical boxes without any rewiring at 90 per cent cheaper than the existing market price while providing more features. This allows the solution reachable to middle classes and thereby improving their living standards while saving energy and providing comfort & fun.
Focus area of innovation	The primary application of this invention is for providing the most advanced and true Internet enabled home and industrial automation systems. The affordability of this solution makes the invention a true enabler for energy saving across the society in developing countries like India which has a population of 1.2B people which makes its participation in energy conservation an essential for the world in fighting against global warming. The solution can be used for both new and existing homes and buildings without any need for special electrical boxes or rewiring.
The Innovation – Description and Working principle	iRam Technologies invented an IPv6 based Internet enabled Electrical Switch to solve the energy utilization problems. In this process, iRam Technologies has developed the most advanced electrical switch in the world that fits into the existing electrical boxes without any rewiring at 90 per cent cheaper than the existing market price while providing more features. This allows the solution reaches the middle classes and helps in improving their living standards while saving energy and providing comfort & living.

The Innovation – Description and Working principle	fun. The Advanced Electrical Switch provides the following features: • Real time control and monitoring • Capacitive touch • Proximity detection • Detects load condition • Takes intelligent decisions • Provides notifications • Cloud connectivity • Fits into existing electrical boxes • No rewiring required • Easy installation In addition, the switch architecture allows connection of various sensors (LPG, Fire, and Smoke) and door locks enabling a complete and seamless home security, safety and automation solution.
Rewards and Benefits Received	iRam technologies received first prize in I3 challenge and appreciation certificate.
Commercialization, impact and Revenue generated by the innovation	Though it is still little early to provide a tangible benefit which would contribute to the carbon foot print reductions, yet the builders are saving more than 50 per cent of cost and significant savings from installations. iRam Technologies' **Advanced Internet Enabled ElectricalSwitch** has been commercialized fully and it has generated revenue worth 1.5 Crore in FY 2014-15. The innovation has a potential to generate revenue worth 15 Crore in FY 2015-16.
Other Projects	iRam Technologies is extremely focused upon launching the Smart Electrical Switch in the metro cities in this year.
Challenges in taking the innovation to next step	One of the challenges is the Industrial Design for the switch plastics to enclose the electronics for making the final consumer product; iRam Technologies is currently working towards this hurdle. Since 90 per cent of the components are imported from outside India, it's another big challenge as in order to scale up the hardware production, it's going to require higher capital investments.

Year of Winning	**2013**
Innovation	**Super-efficient ceiling fans – Super Fan**
Innovators	Sundar Muruganandhan
Educational Qualifications	M.S., Electrical Engineering, University of Missouri Rolla
Organization's/Start up's Name	Versa Drives Private Limited
Professional Background	Engineer/Businessman

Motivation behind Innovation	There are an estimated 350 million ceiling fans used all over India for about seven hours every day, consuming 39W each, running at a medium speed. That creates a demand of 13650MW. That also means 95000MU are consumed every day in running of these fans. In 2011, an estimated 32 million were sold and the market is expanding by 6 per cent every year. The ceiling fans that are currently available in the market use single phase induction motors. These motors are inexpensive to manufacture but they are very inefficient. They directly work from the standard 220V AC power supply using a capacitor. Over the years the design was improved but still a lot more is desired. As a result, Versa Drives has decided to come up with "Super Fan", a solution which is going to have an enormous effect on energy consumption in India
Focus area of innovation	The focus is energy saving without compromising the comfort of consumers all over India using 350 million ceiling fans every day. Being cost sensitive, the target segment will be institutions, commercial places and upper middle class consumers.
The Innovation – Description and Working principle	To make an energy efficient ceiling fan the general idea is to change the type of motor to a less energy consuming one. Permanent magnet BLDC motor is one of the options. The BLDC motors have permanent magnets that make them more efficient but more expensive. They also require sensors to indicate rotor position to the electronic drive. Using an electronic drive introduces harmonics to power source. If this is not controlled, the use of millions of ceiling fans will reduce the effectiveness of our power distribution system. To overcome the challenge of using expensive BLDC motors, Versa Drives came up with a design of an electronic drive circuit that uses a small micro-computer, but would cost the less to perform the same function. Versa Drives then developed a motor that would be efficient and at the same time cost effective. Armed with basic underlying technology, we spelt out a product specification that would equal or exceed the specification of products currently available in the market - Low power consumption, High speed, Remote, Stable speed, Simple installation procedure, Power factor control, Stylish and Green - and all these at lowest possible incremental cost.
	High speed, Remote, Stable speed, Simple installation procedure, Power factor control, Stylish and Green - and all these at lowest incremental cost.
Rewards and Benefits Received	The innovation receivedI3 cash prizes and appreciation certification in 2013. Further won "Emerging Entrepreneur 2014" from Southern Region of CII.
Commercialization, impact and Revenue generated by the innovation	Super Fan was commercialized at the time of i3 challenge 2013. It was one of the major reasons which led to their winning of the challenge as it was a real-life usable product to save energy rather than merely a concept of the same. So far 40,000 units have been sold. Till now, Super Fan has generated revenue worth Rs. 12 crores. There is a potential for selling a few million units within the next five years time.
Other Projects	Versa Drives is working towards using their developed super-energy efficient motor in other appliances as well.
Challenges in taking the innovation to next step	Being a small company, Versa Drives is currently facing challenges in creating awareness about the product among common people by the way of advertising to reach potential customers. They are currently trying to reach out to as many potential customers as possible, including government as they use high number of ceiling fans in the public buildings. Government can benefit with the huge energy savings provided by the Super Fan.

Year of Winning	2013
Innovation	**Novel bacteriophage derived anti-staphylococcal protein**
Innovators	Dr. Janakiraman Ramachandran
Educational Qualifications	PhD in Bio Chemistry from University of Berkley, California
Organization's/Start up's Name	GangaGen Biotechnologies Pvt. Ltd.
Professional Background	Post doctoral appointed assistant professor and later to senior professor in University of Berkley and head of the department of biochemistry and biotechnology departments in University of California. In 1998 Co-founded, Genentech in California. Worked with Astra for 14 years and appointed R&D India Head in 2000. Currently working as the chairman of GangaGen Biotechnologies Pvt. Ltd.
Motivation behind Innovation	Mostly biotechnological industries are using conventional antibiotics for treating bacterial infections but the problem lies in the fact that over the time, the bacteria develops resistance to the traditional antibiotic and results in a severe disease. One such staph infection named as Methicillin-resistant Staphylococcus aureus (MRSA) is a 'Superbug', resistant to multiple antibiotics. Superbugs are increasingly becoming a menace both in hospitals and in the community. It has been recognized throughout the world that there is an urgent medical need for the prevention and treatment of MRSA infections of surgical and other wounds. GangaGen's StaphTAME is being developed to prevent serious, and often fatal, infection MRSA.
The Innovation – Description and Working principle	The novel recombinant protein, StaphTAME, engineered by Dr. Janakiraman Ramachandran's team at GangaGen, offers a solution for the prevention and treatment of multi-drug resistant Staphylococcal Infections. The innovation is a Novel Recombinant Protein; StaphTAME (designated StaphTAME) designed for the prevention and treatment of multi-drug resistant Staphylococcal Infections. StaphTAME would be a first-in-class protein antibacterial that is derived from bacteriophages, or bacterial viruses present in nature. The molecule was developed based on a key protein identified to be present as a structural component of a Staphylococcal bacteriophage. When phages first interact with a bacterial cell, they damage the cell wall in order to insert their genetic material. GangaGen identified the active portion of the phage structure that causes this damage and incorporated it in P128 for specific and rapid binding to the surface of Staphylococcus cells. StaphTAME is capable of binding to and causing lethal damage to cell wall of S. aureus. StaphTAME protein has been tested against over 200 strains of S. aureus of global representation, more than half of which are methicillin-resistant, and has proved capable of killing all of them in a dose dependent manner. Several animal studies have been conducted in which the efficacy of StaphTAME in vivo has been demonstrated, including nasal carriage model in mouse and wound infection mod els in rats. Bactericidal activity of the protein is unaffected in complex biological matrices including whole blood, plasma and normal and hyper-immune sera and has proved efficacious in animal models of infection. Currently, first and second stages of the clinical trials have already been done and the results have been verified by FDA. GangaGen is now looking for commercial partner to help them with resources required to take the production to a much larger level and market the product. GangaGen is planni ng to target an annual market of 500 million US dollars. The major countries considered for the launch are USA, Europe and Japan.

Rewards and Benefits Received	GangaGen received cash prizes and certification for the event. Being a self-funded company, no incubators or VCs were contacted.
Other Projects	Apart from developing StaphTAME to its next level, GangaGen is also working on developing other proteins to fight gram negative bacteria. The research and development in this direction is ongoing.
Challenges faced in current innovation	After FDA's approval the third stage in the clinical trial is to take the production to a much larger level to cater to the demand available in the market. But being a small company, it doesn't have the required resources and funding for the same. It's difficult to get commercial partner in India as such clinical trials are not yet allowed in India, which makes it highly difficult to get marketing partners. Currently, GangaGen is actively trying to find commercialized partners from USA to help them in their resource requirement.

Year of Winning	**2011 and 2012**
Innovation	**DG Interface Unit (DIU) & Digital Location System (DLS)**
Innovators	Shrikant Kunden
Educational Qualifications	Bachelors of Engineering in Mechanical Engineering, Maharashtra institute of technology and MBA in Finance, PUMBA
Organization's/Start up's Name	iZon Technologies Pvt. Ltd
Professional Background	12 years of working experience in Telecom sector with Foseco, Kale Consultants, Zenith InfoTech and 10 years of experience as an entrepreneur in the technology domain with iZon Technologies, AIO systems
Motivation behind Innovation	Indian postal services faces many challenges in delivering the post to the right address due to either incomplete or wrong address as there is no pre-defined standard format for address writing. The major affect of this directly comes down to the consumer as the consumer will again be paying the delivery charges to have the post delivered to the right address. DLS converts the address to a numeric code which is unique to each address and thus can offer the postal services as well as the consumer a smooth and problem free delivery process.
Focus area of innovation	DLS is targeted to help the consumers across urban and rural India in areas like postal services, hiring auto-taxi, telecom sector, TV -shopping, internet-shopping, education, property tax, online tenant monitoring system for police

The Innovation Description and Working principle	iZon Technologies has developed "Digital Location System" – a novel, innovative, patented technology to manage postal-address quality. This system will ensure that addresses are complete, correct, validated and standardized. Most importantly, to make it convenient and, avoid human errors in communication DLS will convert the complex, lengthy postal address into a 12 digit numeric, unique code (just like mobile number) called "DLScode". Thereafter, you can just communicate your DLScode to the others. People can receive/import the complete address against the DLScode through any of the gateways like SMS, Toll-free number, internet etc. The access to gateway will be free and, unlimited. Since, this is first of its kind of addressing system across the world; iZon has filed patent on this in 2011. For confidentiality reasons, DLS will not be including name of the person/ member in the address details. Therefore, others will not come to know about your DLScode unless you share with them. There is no facility provided to find out address or DLScode based on the person name. DLScode can be used to communicate trip-destination address to Auto/ taxi, while hiring. The commuter / passenger shall send in the destination DLScode and driver's mobile number onto the DLS-SMS-Gateway (like, 58888). Within 5 seconds, the gateway shall SMS detail address (in local language) on to the driver's and passengers' mobile number. With this, the errors/ mistakes in telling and listening to the address shall be eliminated. Most importantly, the details of the trip shall be stored in the database on permanent basis. Banks can as well use DLScode to maintain common register of homes/ offices/properties mortgaged/ loaned. A common register of loaned properties will help banks to check and verify whether the home/ office/ property is carrying any existing loan which is un-disclosed by the borrower. Many times banks find multiple loans taken on same property or loan taken on non-existing property. Banks will take "Address Certification and Encoding Services" from DLS and, iZon will intern deliver the same having strategic tie-up with India-Post. Public listed companies distribute DIVIDENDS to their shareholders. And, as on today there are huge number of dividends undelivered/ returned due to inadequate address of the shareholders. The value of such undelivered dividends is in crores. Neither the public limited company nor the shareholders are benefited because of "DividendUndelivered". Public listed companies will take "Address Certification and Encoding Services" from DLS and, iZon will in turn deliver the same having strategic tie-up with India-Post. Currently, Innovation is being commercially launched by July 2015. DLS is supposed to generate revenue of 500 crores in next five years.
Rewards and Benefits Received	Innovation received cash prizes and appreciation certification from I3.
Other Projects	Currently iZon is planning to capitalize DLS under Prime Minister's initiative "Digital India System'. Apart from this a social media networking website, named 'Boomla' is to be launched by August 2015. Boomla will provide a platform for public networking on civic service related issues.
Challenges in taking the innovation to next step	After the innovation challenge, no financial support has been provided by the Indian Angel Network, which is a huge financial setback in taking the innovation to a larger commercial level. Apart this marketing skills and networking also impose major issues in the development. Currently, innovators are also facing difficulties in finding the right mentorship to prepare the right business plan to pitch to the angel investors and venture capitalists.

Year of Winning	2012
Innovation	**A device to trap particulate matter (smoke) from engine exhaust without increasing backpressure**
Innovators	Adess Singh, RDS Tiwana
Educational Qualifications	Mr Singh has a B.Sc (Hons) in Physics, MBA and M.Phil in Management. Mr Tiwana possesses an honours degree in Food, Science and Technology and an MBA in Finance.
Organization's/Start up's Name	None
Professional Background	Mr Singh has been a Medical Representative and innovator since 1982. He chose to stay in this position for he wanted to fulfil his pursuit to innovate for the larger benefit of the community. Mr. Tiwana founded and continues to manage highly successful businesses in the fields of manufacturing, civil construction and garments exports. All through the nitty gritties of establishing and running diverse businesses for over 30 years, Rajan has always found time to nurture his natural curiosity towards science and its application in practical everyday life. It is this insatiable curiosity and a fine scientific mind which brought him in contact with Mr. Adess Singh and was like the coming together of two kindled spirits. They have been working together for over t en years and have developed many proprietary and ground breaking processes and products . The said innovation has been awarded a National award by the Ministry of Science and Technology and has also been inducted into the prison program, a DST initiative.
Motivation behind Innovation	According to Mr Adess Singh, his motivation behind developing the innovation was stirred by an incident that took place well over 25 years ago. On his way back after dropping his children off at school; stuck in a traffic jam; he got the idea to develop a device to trap particulate matter in vehicles. It was then he set out to work on this innovative project which has since been rewarded a National award.
The Innovation Description and Working principle	Particulate matter from engine exhausts can lead to life modifying situations. Fine particulate matter of density below 25 micron is reparable and goes down to the lungs. These particles carry allergens and carcinogens with them. Studies have found traces of this particulate matter in new born babies as well. Diesel and petrol engines are incapable of filtering this particulate matter. This is where the innovation comes in handy; as an effective device to efficiently trap particulate matter without increasing the resistance to flow of exhaust, without using any exotic materials or any moving parts. A significant advantage of the innovation is its ability to fit any internal combustion engine, irrespective of the type of engine or fuel used.
Rewards and Benefits Received	Mr Singh and Mr Tiwana received cash prizes and certificates from CII after winning the competition. They were in talks with IAN and CIIE Ahmadabad for incubation and commercialization assistance but it did not materialize.
Other Projects	Other projects being developed include a refrigeration project – refrigeration in heat. Testing underway under the supervision of DRDO for blast force mitigation project – to control landmine blasts under vehicles.
Challenges faced in current innovation	According to Mr Singh, he has faced no insurmountable challenge so far. However, as with most innovations; there is an element of disbelief amongst people regarding the usefulness of the project.

Year of Winning	2012
Innovation	**Intelligent Automobile Software**
Innovators	Srinivas Dhanabalan
Educational Qualifications	B.Tech in Electronics and Electrical Engineering from Anna University. Currently pursuing Master's degree in Mechatronics in Germany.
Organization's/Start up's Name	Matric Pvt Ltd
Professional Background	Worked as a system engineer for 2 years with Grips Industrial IT Solutions
Motivation behind Innovation	The problems faced by the disabled and the society's apathy towards their condition motivated Srinivas to come up with this device to assist the physically challenged drive on their own, without depending on other people.
The Innovation – Description and Working principle	The difficulty of driving a car by the physically challenged people with amputated leg or limbs is discussed here. With the improvements in recent technologies, the car manufacturers focus on sophisticating the user of the car more and more. Very few cars are designed with the aim of helping the physically challenged people. Now , voice technology has come in hand to help the challenged people with this scheme. The designed system minimizes their physical movement for the different controls withinthe car such as turning the headlights on and off, lane indicators, hazard light, wiper control, flash light (dip and dim) etc. They can use their voice to control these features when they are driving. In addition, the car could communicate with the driver to warn him/her about any faults or malfunctions such as low engine oil, low brake oil, brake failure, low air pressure in the wheels etc. in the car with voice prompts. This could alert him/her to prevent accidents while driving. The system makes use of Microsoft speech recognition system along with RF microphone linked to the main computer. The different controls are actuated through an embedded controller (Atmega 16) linked through parallel data communication link to a main computer. The system runs on Windows 7 or 8.
Rewards and Benefits Received	Cash prize and Certificates
Other Projects	Srinivas is working to optimise Intelligent Automobile Software and make it more cost efficient. He has also developed 'Intelligent Home'; a completely automated device which controls home appliances using voice command and face recognition. This device operates on a wire communication system. Total productionnd installing cost of this device is Rs 10,000 per unit.
Challenges faced in current innovation	Getting adequate funding for further development and difficulty in effectively marketing the product have been the major challenges.

Innovators were also asked to share their experiences with CII's i3 challenge such as motivation behind participating in such a challenge, benefits, short-comings and areas of improvement. Following the discussion with previous year winners, below are the suggestions to further enhance the quality and outcomes of i3 challenge:

1. Advertise via Social Media

CII can expand the advertising through social media to reach out to more innovators across India, especially the young innovators. It will spread awareness about the i3 challenge as well as can result in a significant increase in the number of participation.

2. Association with more Number of Investors and Incubators

Funding is a crucial part in developing the idea from an innovation to a commercial product/ service. Apart from appreciations and cash prizes, the participants are also looking for assistance in their funding requirements. CII can focus on associating more number of investors and incubators to the i3 challenge ensuring that the winning innovation will receive the required funding requirements through these investors and incubators.

3. Post Competition Support to the Winning Innovators

While the i3 challenge is well designed and properly thought-through challenge, CII can also play an important role in linking the innovators to the investors post competition. Through CII's extensive network, CII has the capabilities to connect the innovators to the right stakeholders to help them take their innovation to next level by providing them required mentoring, advisory and financial support.

4. Encourage Media Presence to Enhance Nation-Wide Coverage

For majority of the participants the key motivation in participating in the I3 challenge is to be able to create awareness about their innovation through the challenge. CII can invite media houses to cover the challenge in order to nation-wide spread of the challenge. This can be a great way in sharing the innovation with the common people and helping the innovator to create awareness about their innovation at the same time utilizing the media exposure to reach out to potential investors.

4.5 Far Eye – A Case Study

By Anushree Goel

This case study is more than just a research methodology to compile a report. This case study has been chosen, not by a competitive process, but by what the subject is and what it has achieved over a very short period of time. It is an attempt to throw light on an innovation by a group of young and dynamic Indians who believe in impacting people's lives by solving everyday business challenges and fundamentally spawning an entire market of opportunities. This case study is also a tool to look back at the India Innovation Initiative, as one of the biggest platforms for innovation and entrepreneurship in the country and a way to chronicle and celebrate the Indian spirit of innovation and home-grown entrepreneurial success.

Most of the information presented here is based on secondary research-data and information provided by Far Eye, by speaking to the co-Founder and insights gathered from online sources.

Far Eye – Enterprise Mobility Solution

Fact File[1]:

- Founded by:

  Kushal Nahata, CEO & Co-founder

  Gautam Kumar, COO & Co-founder

  Gaurav Srivastava, CTO & Co-founder

- Year of company launch: 2013
- Location: New Delhi (Start Location & Head Quarters) & offices in Dubai, Bangkok, Mumbai, Bangalore.
- Business presence in: PAN India, Middle East & South East Asia.
- Achievements:

  Impressive 20-fold growth in the last 9 months
  More than 5 million transactions per day worldwide Presence in 10 countries in two years

- Funded by: Indian Angel Network (2013)
- Awards and Recognitions: NASSCOM Emerge 50 (2014-15) [August 2014], CII India Innovation Initiative Award [January 2013] and Nasscom Social Innovation Honors (NSIH) [January 2014]

Founded in 2013 by a group of enterprising young men- Kushal Nahata, Gautam Kumar and Gaurav Srivastava- in New Delhi, Far Eye is a SaaS based enterprise mobility platform that automates processes and field workforce of companies across different industries from Online Marketplace to Hyperlocals to Travel and Tourism and Hospitality. Over a span of just two years, it has emerged as a global IT start-up with offices in Mumbai, Bangalore, Dubai and Bangkok and over five million transactions a day across 10 countries including pan India, Middle East & South East Asia[2].

Far Eye hosts a mobile workforce management platform that schedules jobs, tracks execution, co-ordinates with mobile workforce and evaluates the performance, all in real time basis thereby, increasing the efficiency and effectiveness of operations of its clients some of which are of the likes of Snapdeal, Jabong, Marka VIP, Fabfurnish, Pepperfry, Godrej, ParaMount, DTDC, Hitachi Hi-Rel, Bajaj Capital, Apollo Pharmacy and Blue Dart. (Alam, 2015) .

The Far Eye team has been recognized as top innovators for their highly innovative use of IT and has bagged several awards such as the Nasscom Emerge 50, 2014-15 Awards, the CII India Innovation Initiative Award 2013, the eOdisha Award and has been conferred with the Nasscom Social Innovation Honors.

The Opportunity

The last three-four years has seen a spate in the number and the scale of e-commerce, hyperlocal and such online businesses, however, streamlining field operations and automation of supply chain is not a cakewalk. Supply chain and logistics powered by the most innovative utilization of technology determines the very existence and sustainability of the enterprise. According to the founders of Far Eye,

[1]Information and business statistics provided by Far Eye to CII, not corroborated.
[2]Data provided by Far Eye to CII

the highest revenue generating industries such as manufacturing and construction spend a trifling on technology and R&D. Out of over a three billion workforce worldwide, only 20 percent leverages technology for higher productivity and better outcomes[3]. Moreover, two-billion-plus workers in the developing world (50 per cent in Asia-Pacific and 10 per cent in the Middle East and Africa) have little to zero access to technology[4].

Despite this picture, research by Ernst & Young (EY) shows that over the next decade, digital information in India will grow from 40,000 petabytes of data to 2.3 million petabytes, twice as fast as the worldwide rate. With 900 million+ mobile connections, 100 million+ active mobile data users and increasing number of connected devices, the amount of consumer and enterprise data will grow exponentially. This translates into a large global business opportunity valued at over a billion dollars waiting to be tapped into.

Aspiring to be a game-changer for field operations worldwide, Kushal Nahata, co-founder and CEO, observes that "Any industry stands to benefit from the use of enterprise mobility solutions and with majority of the industries untapped the market presents a huge opportunity to FarEye." Explaining the nature of the enterprise mobility market at the time they were "starting-up" he says, "We were looking for organizations which are having a field workforce. Adding to it we were also open for companies which require process automation like Travel and Tourism. We have designed and worked on specific use cases for each industry that helped the companies work better."

The Innovation

FarEye is an end-to-end technology provider for field services especially for the industries like hyperlocals, logistics and ecommerce. It is a platform that works to empower the field executive and the manager by digitizing the operations. It facilitates real time co-ordination with mobile workforce, task automation, constant job updates, tracking workers, identification of best worker to perform a task, reduction in manual work, analytical reports and smarter decision making for its clients. (Alam, 2015).

When these critical operations are run on mobile combined with higher-order functions such as cashless transactions enabler (wallets), network impact & data analytics, enterprises are able to enhance their productivity, revenues and customer satisfaction. FarEye provides the following key business solutions to its clients across industries, functions, workforce strength and geographies:

- Scheduling & Dispatching
- Monitoring of field workforce
- Predictive Analytics
- Operational Analytics
- Performance Reports

Far Eye claims that its platform is made in such a way that it can be customized and seamlessly integrated into the existing workflow of the organization to streamline, improve and enhance the operational processes and productivity of the organisation, increase revenues and empower all stakeholders. After making a beginning with logistics, FarEye has forayed into Hyperlocals, Consumer Durables, Banking Insurance and Finance Services (BIFS) and, Healthcare, ecommerce and has registered a remarkable 20 times growth in the last nine months[6].

Fig 1.The above diagram explains how FarEye solves operational and supply chain problems of enterprises and works to create win-win propositions for all stakeholders.

[3]Data provided by Far Eye to CII
[4]Data provided by Far Eye to CII
[5]Source: http://www.ey.com/IN/en/Industries/Technology/Big-data-and-enterprise-mobility-in-India
[6]Data provided by Far Eye to CII

The FarEye interface leverages the power of **predictive analytics (location-based and operational), artificial intelligence and automation** to provide business insights from large data to facilitate accurate and faster decision-making and planning the way ahead thus, reducing dependency on intuition and assumption. For instance, Far Eye does Seller on Boarding, For instance, Far Eye does Seller on Boarding, Seller's App, Last Mile Delivery and First Mile Pickup) and using predictive analytics e–commerce companies can analyse a consumer's historical pattern and accordingly recommend products or services, predict their convenient time of deliveries, the preferred location, and preferred point of delivery.

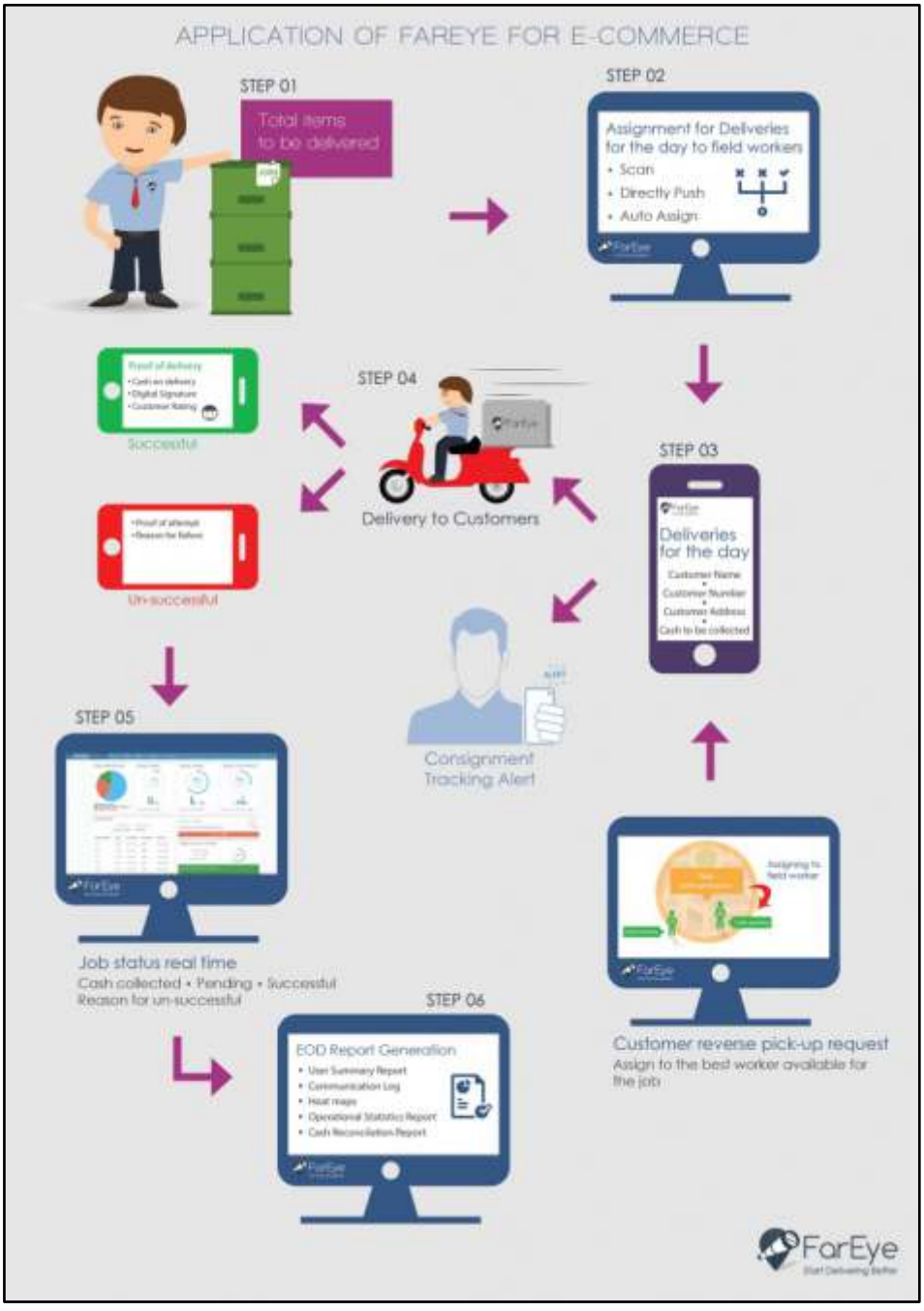


Fig 2: How the FarEye platform works for e-commerce delivery. (Source:FarEyeBenefits)

Benefits[7]:

- Elimination of manual planning, schedule, tally cash and reporting of day's work
- Accurate reports and data for analytics allowing smoother & smarter operations
- Easy and quick decision making due to real time information across all stakeholders involved in the delivery process at any point in the day)
- Stores data of previously visited consumers eliminating need to contact them repeatedly
- Real time notification of customer vagaries allowing more responsiveness & faster problem solving
- Immediate customer feedback at Point of Delivery reducing the need to reach out to the consumer

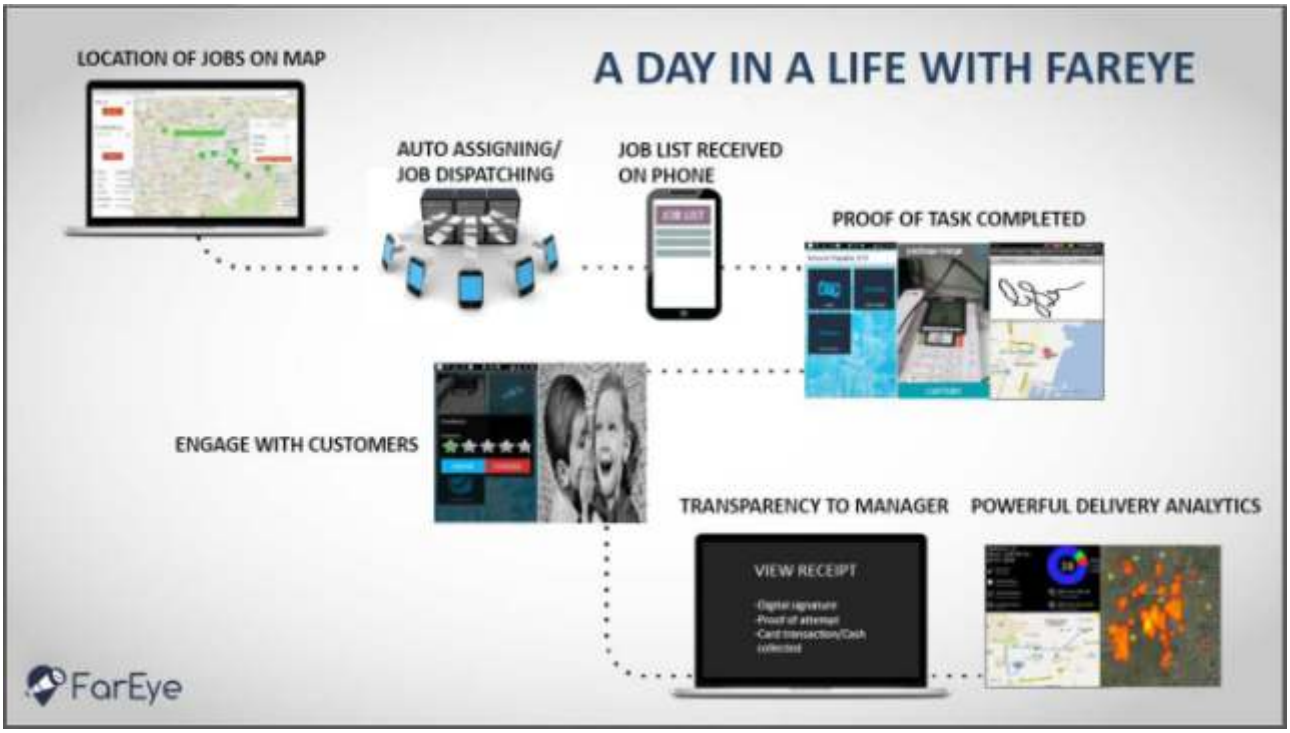


Fig 3: The above diagram represents a typical day at FarEye (Source: FarEye)

Challenges:

Some of the myriad challenges identified by FarEye are as follows:

1) Companies give secondary or tertiary priority for IT, which is changing now-a-days with the spread and penetration of robust technology especially mobile among the general populace.

2) In the Logistics and Hyperlocals sectors, the challenges range from inefficient last mile Delivery to lack of transparency in field operations/ workforce visibility, low responsiveness to customer vagaries & requests to lack of technology adoption to Consumer Switching behavior due to increase in the number of Hyperlocals[8].

3) After Sales Services of consumer durables is fraught with problems of resource allocation (getting the right person to the right place at the right time and with right inventory and tools), rising costs of operations due to idle time, inaccurate data, disconnect between the service engineers on the field and the backend staff, consumers with high expectations spread across vast geographies[9].

[7]Information provided by FarEye to CII
[8]Source: http://www.fareye.in/delivery-management-software.php
[9]Source: http://www.fareye.in/after-sales-service.php

The Competition

Though at a nascent stage, the enterprise mobility market is growing and is expected to touch $ 1.8 billion by 2017 as a rising number of enterprises are adopting mobility platforms or apps for enhancing productivity at the workplace and streamlining and building-up business processes. According to research firm IDC, the enterprise mobility market in India is forecast to grow at a CAGR of 63 per cent from $ 394.3 million in 2012 to $ 1.8 billion by 2017.

Today's young and tech-savvy generation armed with smartphones and tablets, powered by wireless networks, is not just leading the consumerism wave but also changing how organizations function. This is leading to greater demand for "third platform technologies" such as cloud and mobility, which in turn is generating the need to re-skill the workforce in areas like app development, big data analytics and social media. With smart business users demanding access to corporate data anytime, anywhere, mobility devices and solutions will become integral components of the overall technology strategy.

Treating this challenge as an opportunity in disguise, the founders of FarEye are excited and are not afraid of the competition. In his interview to online newspaper, Your Story.com , Co-Founder and COO, Gautam Kumar says that most firms in the segment are offering domain-specific product and not a platform which can be customised and integrated across industries and functions. "Certain global companies (such as Click Software and JDA) offer services similar to those offered by FarEye, but they are not present in the geographies that our startup is present in or planning to penetrate," he says.

Journey as an Innovator and Entrepreneur

Describing his innovation and entrepreneurship journey, Kushal Nahata, CEO & Co-founder says, "I define it as a PCM- Problem, Customer, Money. Business model should clearly define the problem we are trying to solve, who would be our customer and how would we make money. Once these three are defined, it gives a good kickstart to go to field and roll out the venture." "Entrepreneurship is a mix of innovation, risk, passion to move smarter & quicker. With the new technologies coming in, one should be ready to innovate constantly to keep the ball moving. And along with constantly innovating, companies should focus on making a strong team rather than just hiring the talent," he adds.

On India Innovation Initiative as a platform for Entrepreneurship

In 2013 FarEye got a top award at the CII 5th India Innovation Initiative and was connected to the Indian Angel Network and successfully received mentoring and funding support for their innovation from the latter.

Kushal Nahata says, "i3 has played a crucial role in terms of visibility to the media and the business world. It gave us the positive energy to move forward. I believe that getting industry inputs from the experts helps in business growth. After i3 we got an opportunity to connect with many VC's, investors and many industry experts. We got ample inputs from them which helped us in developing the product as per industry needs and devising our business expansion strategy."

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Graphics: Figure 2 and 3 provided by Far Eye to CII.

[10]Source: http://articles.economictimes.indiatimes.com/2014-03-12/news/48154060_1_cloud-and-mobility-workforce-apps
[11]Source: http://www.ey.com/IN/en/Industries/Technology/Big-data-and-enterprise-mobility-in-India
[12]Source: http://yourstory.com/2015/09/fareye/

About the Author:

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[7]Information provided by FarEye to CII
[8]Source: http://www.fareye.in/delivery-management-software.php
[9]Source: http://www.fareye.in/after-sales-service.php

5. THE i3 CHALLENGE 2015

5.1 Overview

India Innovation Initiative (i3) 2015 is the seventh successive edition of the annual competition which is conducted by the National Council for Science and Technology Communication (NCSTC), the All India Council for Technical Education (AICTE) and the Confederation of Indian Industry (CII). This competition was instituted by NCSTC and CII in 2009. The initiative's objective is to create an innovation ecosystem in the country by sensitizing, encouraging and promoting innovators and facilitating commercialization of their innovations. In addition to the three principal organisers of this initiative, there are several other partner organisations comprising business incubators, angel investors and venture capitalists. The jury in this competition consists of eminent scientists, technologists, academicians, educationists and corporate leaders.

Applicants are usually from micro, small and medium enterprises (MSMEs), academic institutions, research laboratories (public/ private), start-ups and grassroots organisations who have a business mind-set and who are keen to convert their innovations into commercial ventures.

There are two basic eligibility criteria which applicants have to meet:

1. They have to be above 18 years of age.

2. Should have a prototype or a working model of their entry (innovation).

5.2 Application and Evaluation Process

The India Innovation Initiative promotes and supports paper-less mode of operations and is run entirely through a digital platform. However, to ensure inclusivity and keeping in mind the varied background of several applicants which may entail non-availability of internet connection or issues with connectivity, the competition does admit entries received through post also. Hence, the entry process entails submitting the program application along with other relevant documents, either online on the program website (www.ciiinnovation.in) or as hard copies to the CII office in New Delhi. The first level of screening is done by an online jury on the basis of innovativeness, the solution it provides to the identified problem and the commercial potential of the project. The the names of shortlisted applicants are put up on the program website and they are also notified by and email. Candidates selected for the final round of competition are invited to participate in the National Fair at New Delhi. At the i3 National Fair, the projects are evaluated by a spot jury based on their relevance, application, novelty, technique and presentation and business potential.

5.3 Timeline

Stage of Program	Date
Competition starts	January 2015
Competition ends	16th September 2015
Announcement of shortlist	16th November 2015
i3 2015 National fair	4th December 2015

5.4 Professional Background of Participants

nnovators from different educational and professional backgrounds, hailing from different parts of the country participated in the event this year. Notable organizations, representatives of which participated in I3 2015 were –

1. BITS Pilani, Hyderabad, Telengana
2. Kongu Engineering College, Perundurai, ,Tamil Nadu
3. Panimalar institute of Technology, Chennai, Tamil Nadu
4. MAEER's MIT College of Engineering, Pune, Maharashtra
5. Babaria Institute of Pharmacy, BITS Education Campus, Vadodara, Gujarat
6. R.V. College of Engineering, Bangalore, Karnataka
7. Institute of Chemical Technology, Mumbai, Maharashtra
8. Ashok Leyland

5.5 Focus Areas

For this year, I3 received innovations in the following fields:

Engineering
- Chemical
- Refrigeration
- Digital Signal Processing
- Electronics & PCB
- Micro Engineering
- Textile
- Nanotech
- Material

ICT
- Communication
- Web
- Retail
- Social
- Mobile VAS

Health Care
- Bio informatics
- Bio Pharma
- Bio Tech

Life Sciences
- Products
- Herbal

Agriculture

Energy

Mobility

Education

Water

Composites
- Bamboo
- Jute
- Coir

Food
- Food Technology
- Dairy Technology

Others

5.6 Rewards and Benefits

This year, top 3 projects will be awarded the i3 Best Innovators Awards that include cash prizes worth Rs. 1 lakh, trophy and certificates. These are:

1st Prize – i3 Platinum Award for Best Innovator includes Cash Award of Rs 50,000, Trophy & Certificate

2nd Prize – i3 Gold Award for Best Innovator includes Cash Award of Rs 30,000, Trophy & Certificate

3rd Prize – i3 Silver Award for Best Innovator includes Cash Award of Rs 20,000, Trophy & Certificate

Special Awards this year:

"Valluri Technology Accelerators Award for Most Promising Innovator". One top innovator will be rewarded with Rs.10,000 cash prize, mentoring and incubation support from VTA and certificate. This award is sponsored by Valluri Technology Accelerators (VTA).

"The Indian Private Equity and Venture Capital Association (IVCA) Award for Top Innovator". Three top innovators will be rewarded with Rs.5,000 cash prize, funding support from IVCA and certificate. The awards are sponsored by IVCA.

"Young Indians Award for Young Innovator". Young Indians (Yi) rewards top 3 young innovators with a Rs. 7,000 cash prize and certificates. The awards are sponsored by Young Indians.

Other Support:

Indian Step & Business Incubator Association (ISBA)	Incubation support to innovators of their choice
Forum for Industry Interaction (FII), Indian Institute of Management, Ahmedabad	Business advisory services and mentoring by FII to any two innovators of their choice
The Indus Entrepreneur (TiE) - Delhi – NCR Chapter	Mentoring support to innovators of their choice
Indian Angel Network (IAN)	Mentoring and incubation support from IAN and certificate to two innovators of their choice
Technology Refinement and Marketing Programme (TREMAP) of Technology Information, Forecasting and Assessment Council (TIFAC)	To provide free technology assessment, marketing support and mentoring to innovators selected by them
STEP IIT Kharagpur	Incubation support to innovators of their choice

6. EVALUATION OF SHORTLISTED PROJECTS

Projects shortlisted for the National Fair are invited to participate in the the final round of evaluation. Innovators exhibit and present their innovations in front of a National Jury comprising of eminent persons drawn from the government, industry and academia.

This year the i3 National Fair will be held on the sidelines of the India International Science Festival (IISF) 2015 organised by the Department of Science and Technology, Government of India, Technology Refinement and Marketing Programme (TREMAP) of Technology Information, Forecasting and Assessment Council (TIFAC) and Vijnana Bharati (VIBHA) at the Indian Institute of Technology, Delhi.

A total of 76 shortlisted innovations will be evaluated on a criteria evolved to gauge the innovation quotient and commercial potential of the project. All entries will be evaluated according to the following criterai comprising the following parameters and sub-parameters. Scores out of a 100 maximum marks were assigned by the jury members against each of these parameters and sub-parameters.

1. Relevance

- Relevance to Industry/environment/society
- How is it better than similar applications

2. Creativity (How)

- Whether the project is technically current
- Is the proposed solution scientifically derived
- Depth of knowledge, skill and analytical ability

3. Implementation Strategy and Plan

- How were the challenges & obstacles overcome
- Is it ready for commercialization
- Existing strategy to commercialize.
- Plans for further improvement.

4. Level of Practical Data / Information Available

- Actual practical achievements shown by the innovator
- Impact it can bring to the society/industry

5. Presentation of project report

- Are the project goals, objectives and expected and actual results clearly articulated
- Is the layout logical and well organized

7. JURY PROFILES

National Jury

S.No	Name of Jury	Designation	Organisation
1	Mr. Venkatesh Valluri	Founder & Chairman	Valluri Technology Accelerators & Valluri Change Foundation
2	Dr. Y.S Rajan	Senior Distinguished Professor	Honorary Distinguished Professor, Indian Space Research Organisation (ISRO)
3	Ntasha Berry	Head Innovation	Indian Private Equity and Venture Capital Association (IVCA)
4	Mr. Abhinav Banthia	Chair	Young Indians (Yi), Jaipur
5	Ms. Deepanwita Chattopadhyay	Chairperson and Managing Director	IKP Knowledge Park, Hyderabad
6	Mr. Sandro Stephen	Head-Operations, North India	Indian Angel Network (IAN)
7	Mr. Pulok Ranjan Basak	Head	TIFAC SIDBI Technology Innovation Programme (Srijan)
8	Dr. T. Chandrasekhar	Scientist-E	Technology Refinement and Marketing Programme (TREMAP) of Technology Information, Forecasting and Assessment Council (TIFAC)
9	Prof. R. Raghunandan	Executive Director	Indian Science & Technology Entrepreneur Parks (STEP) and Technology Business Incubators Association (ISBA)
10	Aditya B.	Representative	Forum for Industry Interaction (FII) Indian Institute of Management, Ahmedabad

11	Amitesh Tyagi	Charter Member	The Indus Entrepreneurs- Delhi NCR & Director, Nimble Ventures Pvt. Ltd
12	Dr. Anil Wali	Managing Director	Foundation for Innovation and Technology Transfer, IIT, Delhi
13	Dr. Mamta Bhati	Professor	School of Open Learning, Delhi University
14	Ms. Ankita Vashishtha	Co-Founder and CEO	Saha Fund (India's First Women's Venture Capital Fund)
15	Prof. Arun Goyal	Professor	Indian Institute of echnology, Guwahati
16	Prof. Rakhi Chaturvedi	Professor	Indian Institute of Technology, Guwahati
17	Prof. M.S.Sutaone	Professor	College of Engineering, Pune
18	Prof. V. S. Raja	Professor	Indian Institute of Technology, Bombay
19	Dr. Niranjan D.Khambete	Professor	Dinanath Mangeshkar Hospital & Research
20	Prof. Ashitava Ghosh	Professor	Indian Institute of Science, Bangalore
21	Prof. S. Chakarborty	Professor Medical Science and Technology	Indian Institute of echnology, Kharagpur
22	Prof. Narende Singh Rathore	Deputy Director General (Engg.),	Indian Council for Agricultural Research, New Delhi
23	Prof. M.P. Poonia	Director	National Institute of Technical Teachers' Training and Research, Chandigarh
24	Mr. Jonathan Mazumdar	Portfolio Manager & Entrepreneur in Residence	Sangam Ventures

National Jury Member Profiles

Mr. Venkatesh Valluri

Founder & Chairman
"Valluri Technology Accelerators"
& "Valluri Change Foundation".

Mr. Venkatesh Valluri is the founder and Chairman of "Valluri Technology Accelerators" and "Valluri Change Foundation".

Valluri Technology Accelerators focuses on building solutions in the areas of Energy, Water, Environment & Pollution, Sanitation & Waste, Healthcare and Transportation & Mobility through convergence of multiple high end domain technologies by partnering with leading global and national organizations.

Mr. Valluri has been associated with various global Industries for over 30 years and has Leadership, Operational and General Management experiences spanning the regions of India, Europe and the US.

Mr. Valluri also served as the Chairman of the board for Ingersoll Rand India's public company operations for over six years until November 2015. Ingersoll Rand is a $14.0 billion globally diversified Fortune 500 Industrial technology Company.

Before joining Ingersoll Rand, Mr. Valluri was associated with the global measurement technology leader, Agilent Technologies, as its President & Country Manager and served as the Chairman of the board for its Indian subsidiary.

Prior to Agilent he held various leadership roles at GE (General Electric) in India and overseas. He served as the Managing Director of GE's Silicones business in India and later as the Business Leader for GE's Specialty Materials business in Europe. He worked as the Vice President of GE's Corporate Business Development group and established multiple businesses and initiatives for GE's operations in India.

Mr. Valluri served on the board of the India chapter of the global NGO United Way as its Vice Chairman. He serves as the Executive-Committee member of TERI (The Energy and Resources Institute) and provides leadership on many sustainable and climate change initiatives. He has been a member of the National Executive board of AMCHAM (The American Chamber of Commerce) and chaired the U.S. India Energy Cooperation Program (ECP). He also served as the Chairman of the National Committee on Technology of the Confederation of Indian Industry (CII) for a period of three years from 2012 until 2015. He currently serves on the Prime Minister's Fellowship scheme board for doctoral research grants instituted in collaboration between the DST and CII. He was a member of the Ministry-Industry Consultative Committee (MICC) for developing the food security standards for cold chain in the country. He also serves as the Member of the Karnataka Knowledge commission instituted by the Government of Karnataka. In 2015 he was also elected as a member of the board of BMS Institute of Technology, Bangalore.

Mr. Valluri holds a Bachelor's in Technology in Electronics and a MBA from IIM Ahmedabad.

Dr. Y. S. Rajan

Dr. Vikram Sarabhai Distinguished Professor,
Indian Space Research Organisation (ISRO)

Dr Y.S. Rajan has a proven track record of excellence as a scientist, technologist, administrator, organisation builder and leader, diplomat, academic, writer and poet. He combines a unique ability for original and innovative thinking with strong implementation skills. He has capability to network with multi–disciplinary and multi–cultural groups.

Dr Rajan has made key contributions to space research, technology and applications since 1964 and continues to be an important expert on space matters. As Scientific Secretary, Indian Space Research Organisation (ISRO), he was responsible for a combination of scientific, technical, administrative, planning, policy and international cooperation matters. His contributions in shaping ISRO from its initial experimental phases into a major service delivery organisation have been remarkable. In the process, Dr Rajan has also been a creator of many institutions and sustainable mechanisms between ISRO and its end-users. He has worked with Massachusetts Institute of Technology (MIT), USA and NASA for about three years.

He is also a well-recognized authority and thought leader on technology development, business management and society linkages. While holding various positions of responsibility related to science and technology (S&T) between 1988 and 2002, he has shaped key policies and implemented several successful R&D projects with industry participation. He has been responsible for creating a series of documents related to Technology Vision 2020 for India, which culminated in a book on a roadmap for socio-economic development for India called "India Vision 2020". Dr Rajan has practical ground level experience in developmental issues and has founded and built organizations like Technology Information Forecasting and Assessment Council (TIFAC), which he has led for about two decades. These organizations have helped to bring relevant technologies to improve productivity for the agricultural, manufacturing and service sectors.

After a 30 year stint with the Government of India (GOI), Dr Rajan joined the leading industry association In India, Confederation of India Industry (CII) in 1996. At CII, he strengthened and expanded their capabilities to interface with Government on S&T and business issues. The technology division which he expanded and strengthened has now become a powerful platform for national and international cooperation between industry, academia and governments. As Principal Adviser (2004-2010) he created unique mechanism at CII for University – Industry collaboration.

He has wide international experience and was responsible for a large number of cooperative projects between India and other countries. He has led Indian delegations to United Nations (UN) and has visited about 40 countries in all continents as a part of cooperative efforts in science, technology and business.

Dr Rajan is an expert in environmentally sound technologies, satellite meteorology, remote sensing, mapping systems and Intellectual Property Rights (IPR) related matters. He has completed special assignments for UN organizations like UNIDO, WIPO and UNEP. He was actively involved in evolving policies and procedures relating to adopting IPR laws in India to the post WTO/TRIP situation and also in preparing the Indian Industry and institutions to master IPR issues.

His engagement with academic world began since 1976 and over a decade was responsible for funding basic research and introducing courses relating to space science and technology in several institutions. He was visiting professor in Anna University for four years (1984–88) and conducted Masters level courses. Since 1988, Dr Rajan has also been responsible for introducing several

innovative courses and creating unique centres of relevance and excellence for industry-academia cooperation, with part funding from industry. As Vice-Chancellor, Punjab Technical University (PTU), he introduced key initiatives to improve the internal processes and the external interfaces of the university. Dr Rajan continues to be visiting faculty, board member and advisor to various renowned Indian academic institutions.

Dr Rajan is also a prolific writer and has written on a variety of subjects, including on science, technology, business, youth, leadership, social and ethical issues. He has authored and co-authored a number of books and has contributed to several others. He has also written a large number of articles in journals in India and International papers/ magazines, etc.

He is an excellent communicator in written and spoken form for different segments of people ranging from school children to accomplished elders.

He has written seven books of poetry in an Indian language, Tamil which has been critically acclaimed by eminent Indian poets. He has also written three books of English poems which have received very good reviews.

Dr Rajan was awarded Padma Shri by the President of India during 2012.

During January 2013, he was felicitated at the India Geospatial Forum, with Lifetime Achievement Award.

Ms. Ntasha Berry

Head, Innovation
Indian Private Equity & Venture Capital Association (IVCA)

Ntasha heads the Innovation Initiative at IVCA. She has worked with Bloomberg New Energy Finance and ANZ bank in the past, focusing on the energy and resources sector in India and Australia.

She is a Santos Scholar and has completed Master of Science in Energy and Resources Management with Distinction from University College London (UCL). She has published her thesis on the investment opportunities for new electricity generation technologies in the state of South Australia by adhering to stringent risk – return investment parameters.

She was bestowed with the Torres Award by UCL for outstanding academic excellence.

She also holds a First Class Honours degree in Bachelor of Science in Finance from Lancaster University in the UK.

Mr. Abhinav Banthia

Chair
Jaipur ChapterYoung Indians & Board member of Quality Circle of India –Jaipur

Born in Jaipur he belongs to the 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 Banthia joined his family owned company Manu Yantralaya Pvt. Ltd. Which primarilysupplies bearing and automotive components with around 30% of exports to Europe, China Argentina , Indonesia etc. There are 3 manufacturing plants under this company.

In 2012 he formed a Japanese joint venture company and have 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.

Currently he is the Chair-Jaipur ChapterYoung Indians and Board member of Quality Circle of India –Jaipur.

Ms. Deepanwita Chattopadhyay

Chairman & CEO
IKP Knowledge Park- Hyderabad

Deepanwita Chattopadhyay, Chairman & CEO of IKP Knowledge Park is responsible for developing the first Life Science Research Park in India and establishing a sustainable innovation and knowledge cluster around a science park through a Public-Private Partnership model. She has deep interest in entrepreneurship, incubation and institution building.

After brief stints as faculty at the Electrical and Electronics Engineering Department, BITS, Pilani and as freelance writer and editor of science material for children, she joined the telecom advisory practice of ICICI Bank Ltd., the largest private bank in India, in 1994. She was deputed to IKP Knowledge Park as its CEO in August 2001.

Ms. Chattopadhyay is the Founder Chairman of Support Elders Pvt. Ltd., a startup committed to providing integrated care for the elderly. She serves as a Director on the Boards of IKP Investment Management Company Pvt. Ltd. and the US-India Science & Technology Endowment Board and as a member of the Governing Body of the National Institute of Immunology and the Lucknow Biotech Park. She is an Executive Council Member of the Society for Technology Managers (STEM). She also served as an international Director on the Board of the International Association of Science Parks.

Mr. Pulak Ranjan Basak

Head
TIFAC-SIDBI Technology Innovation Programme (Srijan)

Pulok Ranjan Basak is a Chemical Engineer. He is presently Head of the TIFAC-SIDBI Technology Innovation Programme (Srijan) in Technology Information, Forecasting and Assessment Council (TIFAC), an autonomous organization under the Department of Science & Technology, Govt. of India. The Srijan Programme aims at facilitating Indian entrepreneurs for scaling up / commercialization of technology innovations. He has been associated with TIFAC for the last 17 years and played key role

in formulating, planning & coordinating various technology development programmes and projects through industry - academia - R&D network.

He has also been instrumental in initiating and carrying out many technology foresight and roadmap studies in TIFAC.

Mr. Basak also has 8 years of industrial experience in state-of-the-art processing technology in a leading Public Sector Undertaking Company.

Mr. Aditya B

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

Aditya is a PGP student at IIM A. He led an automation team of 15 as a part of Rs.340 Cr project at Coromandel & optimized the bagging operations to augment throughput by 50%. He worked on a health-care startup idea in the summer, visited numerous hospitals & clinics to explore design of an working EMR. He is a core member of Confluence-Strategy team & Forum for Industry Interaction. He served as a Placecom member and PR manager for Tech Fests at NIT-T. He won under-16 karate tournament

Mr. Amitesh Tyagi

Charter Member
The Indus Entrepreneurs-Delhi NCR & Director, Nimble Ventures Pvt. Ltd.

Amitesh Tyagi is a first generation entrepreneur with interests and investments in technology and Consumer Internet focused startups, specifically with the companies that are targeting to make a 'big impact'. Amitesh co-founded Nimble Ventures Pvt Ltd that runs IndiaLetsPlay – India's Leading Sports and Fitness Store. Company was among the top 7 featured on Lufthansa Runway To Success Season 3.

Currently, Amitesh is active in Technology and Marketing solutions for various sectors such as education, manpower mobilization, sports, retail, IT, manufacturing and supply chain sectors. He is Angel Investor in Gamineazy and is an advisor to iidea8 Partners, Obbserv and Scryptyk Solutions. He is also a Charter Member for TiE, New Delhi.

Amitesh is an alumni from Indian Institute of Management, Ahmedabad and is a two-time PMP qualification holder. He has also done course in Customer Relationship Management from INSEAD, France.

Amitesh has worked in TATA Motors, Infosys, and Wipro in the past in various leadership roles.

A true believer in Innovation and Technology, Amitesh is in last stages of launching an innovation and idea exchange platform - atmantra.com to further propel the innovation engine in the country.

Dr. Anil Wali

Managing Director
Foundation for Innovation & Technology Transfer, IIT, Delhi

Dr. Anil Wali is currently the MD at Foundation for Innovation and Technology Transfer (FITT) – an autonomous industry interface organization of IIT Delhi. He is managing technologies and driving innovations and enterprise at the academia besides looking at issues of concern to SMEs. He has worked in chemical industry for 19 years before taking up the present position.

Besides several publications, patents and reports to his credit, he has a strategic customer and quality orientation, and brings a practical perspective to solving technical problems. He is also called upon to deliberate and participate in the area of clean technology and sustainability. His multifaceted experience towards technology innovation and management, industry partnership, project issues, entrepreneurship, IPR, education, training, etc is sought for advice / association with several committees and programmes.

He is an IIT Delhi Doctorate.

Ms. Ankita Vashistha

Co-Founder & CEO
Saha Fund (India's First Women's Venture Capital Fund)

Ankita is Co-Founder and CEO of Saha Fund, India's first SEBI registered venture capital fund to promote and invest in women entrepreneurship. Saha Fund will invest in companies run by women founders/ senior management, companies hiring 50% or more women, or companies creating a service or product for women consumers.

Ankita who has over 8 years of experience in private equity and venture capital across UK, US and Asia, wants to promote women entrepreneurship, employment and engagement through Saha fund, which is raising 100 crores to invest in companies in India with a small global carveout.

She is also part of the Indian Angel Network and works very actively in the start-up ecosystem in India, Philippines, Singapore, UK, USA to source, evaluate, mentor and invest in start-up companies. Ankita works closely with portfolio companies to help them create value, scale and expand leveraging technology. Previously she had worked at Tholons Capital, Aureos Capital/Abraaj Group and Tholons.

Consulting. At Aureos Capital, Ankita was part of the global investor relations team and also helped track the global portfolio of funds. Helped raise funds for Africa Healthcare fund, India Fund II and and South-East Asia Fund II totaling to more than US$400 million.

Ankita is an engineering graduate from VTU and Masters from Cranfield school of Management, UK

Prof. Arun Goyal

Professor
Indian Institute of Technology, Guwahati

Born in Rewari, Haryana on June 2, 1965; School Education at Ramjas Senior Secondary School No. 5, Delhi, 1975-83; B.Sc.Chemistry, Hindu College, Delhi, 1983-86; M.Sc.Chemistry, IIT Delhi, 1988; M.Tech.Biotechnology, IIT Delhi, 1989; Ph.D.,IIT Kanpur, 1995. He qualified National Scholarship examinations of GATE and UGC in 1988.

Post-doctoral Fellow, Department of Biochemistry, University College Dublin, Dublin, Ireland, 1996-98; Visiting Scholar, Neurobiotechnology Center, Ohio State University, USA, Nov1998 -Feb1999; Post-doctoral Fellow, Department of Biological Sciences, Wayne State University, Detroit, USA, Feb1999 - Sep1999; Scientist, Department of Biotechnology, Birla Institute of Scientific Research, Jaipur, Feb2000-Jun 2000; Post-doctoral Scholar, Faculty of Veterinary Medicine, Lisbon, Portugal, Sep2000 -Aug2003; Visiting Associate Professor, Department of Biotechnology, IIT Guwahati, 2003-2004; Vice-Chairman, GATE-2006, Associate Professor, Department of Biotechnology, IIT Guwahati, 2004-2009; Head, Department of Biotechnology, IIT Guwahati, 2009-2013. Currently, Professor, at Department of Biosciences and Bioengineering at IIT Guwahati, since 2009. Professor Goyal has supervised 16 PhD students, executed over 10 projects worth several crores as PI, published 160 papers and 300 conference papers.

JV Bhat Award for Best Paper in Indian Journal of Microbiology 2007 & 2012; CV Raman Award for

"National Young Teachers Excellence Award 2010" by IES Group of Institutions, Bhopal.

Elected Fellow, Association of Microbiologists of India (FAMI), 2006 for outstanding contributions to Microbiology; Fellow, Biotech Research Society, India (FBRS), 2008; Fellow, Association of Biotechnology and Pharmacy (FABAP), 2009; Fellow, National Academy of Biological Sciences (FNABS), 2010; Fellow, National Academy of Agricultural Sciences (FNAAS), 2011. Awarded Fellow, International Forum on Industrial Bioprocesses, (FIFIB) Taiwan, 2012.

Prof. Rakhi Chaturvedi

Professor
Indian Institute of Technology, Guwahati

Dr. Rakhi Chaturvedi is the Professor of Biosciences and Bioengineering (BSBE) Department at IIT Guwahati, Guwahati. She obtained her Bachelor and Master degrees from University of Allahabad, Uttar Pradesh, India. Subsequently, she received M.Phil. (1996) and Ph.D. (2001) degrees from University of Delhi, Delhi, India in 1996 and 2001, respectively.

After her post-doctoral studies from Jawaharlal Nehru University, New Delhi, India, Dr Chaturvedi joined IIT Guwahati in the year 2004 as Assistant Professor in the Department of BSBE. Dr Chaturvedi held important Academic and Administrative positions. She served as Vice-Chairperson GATE-JAM 2013, Chairperson GATE-JAM 2014, Chairperson GATE-2015 and Organizing Chairperson JAM-2015 examinations. Currently, she is the Associate Dean of Alumni Affairs & External Relations at IIT Guwahati.

Her broad research area is Plant Biotechnology. She has ample scientific knowledge and have established a solid foundation both theoretically and experimentally in the area of Plant Tissue Culture and Secondary Metabolite Production, Plant Biochemical Engineering and Plant Sciences, which she has been applying in simplest to the complex plant systems ranging from herbs to the trees. Dr Chaturvedi has published 8 book chapters, more than 50 conference proceedings and over 33 publications in peer reviewed international journals of high impact factors like, Biotechnology Advances with impact factor as high as 9.0. She is the recipient of prestigious 'Prof Y.S. Murty Medal 2011' by Indian Botanical Society and Overseas Travel Awards from DST, New Delhi and INSA New Delhi, India. She is nominated member of National Academy of Sciences, India (NASI) & Society for In vitro Biology (SIVB), USA. She is the Associate Editor of "In Vitro Cellular and Developmental Biology-Plant" by Society of In Vitro Biology (SIVB), USA and published by Springer. She has guided more than 23 B.Tech., M.Tech. & Ph.D. students.

Prof. M.S. Sutaone

Professor
College of Engineering, Pune

Dr. Mukul Sutaone is Professor in Electronics and Telecommunication department at College of Engineering, Pune (COEP). With over 27 years of experience in Academics, Research and Industry, Prof. Sutaone is currently is Dean-Academics at COEP. His areas of interest in Teaching and Research are Multmedia and Multidimensional Signal Processing, Communication Networks and VLSI Design. He has pioneered, conceived and executed series of courses on Entrepreneurship, Leadership and Innovation for the students of COEP. In the capacity of Principal investigator of the Center of Excellence in Signal & Image Processing, a World Bank funded project by MHRD-GoI (under TEQIP-II),Prof, Sutaone is associated with the development and conversion of prototypes from mere Proof of Concept (PoC) to transferrable technologies. Some of such projects are 'Video Stabilization for Cell Phones' 'Automatic Number Plate Recognition System for Vehicles' and 'Density and Direction detection for Stampedes'. An applauded resource person in many conferences, workshops and symposia, Prof. Sutaone is recipient of Prof. SVC Aiya IETE National Award for Excellence in Telecomm. Education.

Prof. V.S. Raja

Professor
Indian Institute of Technology, Bombay

Prof. V.S Raja, Institute Chair Professor in Department of Metallurgical Engineering and Materials Science, Indian Institute of Technology Bombay, is a nationally and internationally acclaimed academician and researcher in the field of materials and corrosion control. He pioneered research in the area of materials development for corrosion resistant applications making seminal contributions to the understanding of the mechanisms of stress corrosion cracking of aluminum, magnesium and titanium alloys and stainless steels that led the development high performance metallic alloys.

Prof. Raja has published over 150 papers in peer reviewed journals and book chapters, about 100 papers in conference proceedings, delivered over 100 plenary and keynote lectures including in all the major international conferences. Prof. Raja supervised about 20 Doctoral and 100 Masters students and consulted over 50 Industries to solved more than hundred corrosion problems. He is the lead editor of the book "Stress Corrosion Cracking: Theory and Practice" published by Woodhead publishers and Co-authored a book on Corrosion Failures: Theory, Case Studies and Solutions published by John Wiley and Sons. He is an editor of transactions of Indian Institute of metals and a member of editorial boards of several scientific journals including Corrosion Engineering, Science and Technology, Metallurgical and Materials Transactions A & E. He has established several international collaborations on corrosion research and has been a guest researcher at Chalmers

University of Technology, Sweden; Visiting Professor at University of Nevada, USA; and Guest Scientist at GKSS Germany and Tohoku University, Japan. He is a member of Research Council of CSIR and DRDO laboratories in India and served as a member of NACE international research committee during 2009-13. In recognition, he received several national awards including, Excellence in Teaching Award (2008) and VASVIK (2014) for industrial research and is a NACE and IIM fellow.

Dr. Niranjan D. Khambete

Professor
Dinanath Mangeshkar Hospital & Research

Dr. Niranjan D. Khambete is an Instrumentation Engineer with 25 years of experience in research and development in the field of Biomedical Engineering. He has worked in Larsen and Toubro Limited, Mysore and Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum and is currently with Deenanath Mangeshkar Hospital and Research Centre, Pune. All throughout his career, he has actively contributed to the medical device research and development needs of the country.

Dr. Khambete has successfully steered indigenous technology development efforts for various types of Bioelectrodes and Portable Medical Electrical Safety Analyser. His research interests include application of bio-impedance spectroscopy for artifact free apnea monitoring, detection of sleep disordered breathing, early detection of cervical cancer and monitoring cell growth in tissue engineered organs.

In recent years, Dr. Khambete has also focused his efforts on promoting safe use of medical equipment in hospitals through development of a strong Clinical Engineering Profession. He was closely involved with development of curriculum for M. Tech. Clinical Engineering programme, the first of its kind in the country. As Secretary, Biomedical Engineering Society of India, he continues to lead efforts aimed at developing a National Certification Programme for Clinical Engineers.

He is the recipient of World Health Organisation's Patient Safety Award and American College of Clinical Engineer's Antonio Hernandez International Clinical Engineering Award for his leadership and commitment to patient safety and growth of Clinical Engineering Profession. He is also a member of WHO's Experts' Committee on Development of Technical Specifications Database for Medical Devices.

Prof. Ashitava Ghosal

Professor
Indian Institute of Science, Bangalore

AshitavaGhosal is a Professor in Mechanical Engineering Department and the Centre for Product Design and Manufacturing at IISc, Bangalore. He completed his PhD from Stanford University, California in 1986, M.S from University of Florida, Gainesville, Florida in 1982 and B.Tech form Indian Institute of Technology, Kanpur in 1980.He has 3 patents, around 60 journal papers and 70 conference papers. He has guided 9 PhDs, 15 Msc (Engg) and more than 35 ME students.His Broad research areas are kinematics, dynamics, control and design of robots and other computer controlled mechanical systems. He also works on kinematics of parallel mechanisms and manipulators.He has authored a text book entitled "Robotics: Fundamental Concepts and Analysis" by Oxford University Press in 2006.

Dr. Narendra Singh Rathore

Deputy Director General (Engg.)
Indian Council of Agricultural Research, New Delhi

Dr. Narendra Singh Rathore, Deputy Director General (Education), Indian Council of Agricultural Research, New Delhi is B.E., M.Tech. (IIT D) and Ph.D. (Agril. Engg.). He has attended Advanced training on Food and Agriculture Business Management (Cornell University USA), Agro Forestry (University of Arizona), Bio Energy (University of Oxford), Waste Recycling (University of Murdoch, Western Australia). He possesses 35 years professional experience i.e. Founder Vice Chancellor SKNAU, Jobner, DDG (Engg) ICAR, Dean College of Dairy and Food science Technology, Dean (Student Welfare), Dean College of Technology and Engineering, HOD in Renewable Energy, PI AICRP on RES, Project Coordinator TBU-IC and RBTC.

Dr. Rathore is recipient of 21 Awards i.e. Young Scientist, Outstanding book, Outstanding Services, ISAE Commendation and Team, Hindi Research Paper, World Bank IDM-2007, Best Teacher, Energy Conservation, National Technology Day, Global Dairy Innovation, IE Fellow and SEE Award. Dr. Rathore had extensively travelled 7 countries i.e. 3 times USA, Australia, Kenya, UK, Singapore, Kuwait, Tanzania and Thailand and signed MOU for student & staff exchange and R&D activities. He has Organized total 8 International Training, 35 National training, 26 State training and 12 ISTE Summer & Winter School and 36 exposure meet and handled 51 R&D projects including 3 International projects i.e. PISCES, CDM &FT. He has commercialized six technologies through NRDC. Total publications to his credit is 32 Books, 24 research papers in referred National Journal, 12 in International Journal, 85 in National and International Proceeding, 29 Proceeding, 14 Review reports and 46 Booklets & Laboratory manual works etc. Delivered 32 key note lectures. He has supervised 30 M.Tech, 15 Ph.D. & 13 M.Sc. Dr Rathore attracted 35 crore from ICAR, MOFPI, DST, MNRE and AICTE for infrastructure development and experiential learning.

He is also responsible for developing linkage at state level (6), national level (4) and international level (2) and conducted three projects under multi-disciplinary networking program. He was instrumental in designing of National Vocational Education Qualification Framework in Agriculture. He has attended 17 visits for approval and accreditation of institutions.

Dr. M.P. Poonia

Director
National Institute of Technical Teachers' Training & Research, Chandigarh

Born on 7th July, 1959 in a small village of Rajasthan state in India, Dr. M.P.Poonia is specialized in the areas of Mechanical Engineering (IC Engines, Gas Dyanics, Ref. & AC), Renewable Energy and Sustainable Development. He is M.Tech (Mech.) and Ph.D (Thermal Engg) from Indian Institute of Technology, Delhi. He possesses 30 of total experience, out of which 6 years as Principal of Govt. Engg. College, Bikaner (Rajasthan) and 1 years and two months as Dean, Planning and Development in MNIT, Jaipur, (Rajasthan).

He has published 80 papers in National and International Journals and published several books and manuals in the field of Mechanical Engineering. He has published/edited 08 Nos. books and 02 Lab Manuals. He is the Member of IEI, ISTE & Society of Automotive Engineers. Dr. Poonia is also a google Scholar. On 20th July, 2012, Dr. Poonia took up the responsibility of Director, National Institute of Technical Teachers Training and Research, Chandigarh (India).

Dr. Poonia made significant contribution as Director of the institute for the growth and development of technical education in the northern states of India and to conduct of sub-regional and in-country programmes in collaboration with Colombo Plan Staff College for Technician Education, Manila, Philippines. Under his able leadership, the institute has to its credit the conduct training programme for Nigeria. He has undertaken projects sponsored by All India Council for Technical Education, Deptt. of Science and Technology, Delhi and Govt. of Rajasthan and MHRD, Govt. of India. He is the recipient of many Awards for his academic achievements and 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. He is the member of Board of Governors of, as many as 20 Government / Autonomous bodies/Universities in the state of Punjab, Haryana, Himachal, Delhi and Chandigarh. He has visited many countries USA, China, Thailand, Singapore & Sri Lanka. At international level, Dr. Poonia is also Adviser, Sustainable Business Network (SBN), set up under the guidance of the ESCAP Business Advisory Council (EBAC) of Asia Pacific Business Forum (APBF).

Mr. Jonathan Mazumdar

Manager & Entrepreneur in Residence,
Sangam Ventures

Jonathan is committed to tackling big problems in global development and has worked across impact investing and impact evaluation. Before Sangam he launched and built Acumen Fund's education portfolio in India. Prior to investing he lived in rural Bihar where he managed a randomized evaluation for the MIT Abdul Latif Jameel Poverty Action Lab (J-PAL). Jonathan holds a BA in Mathematics & Economics from Tufts University.

Online Jury

S.No.	Name	Designation	Organisation
1	Mr. A. B. Balachandran	General Manager	Vellore Institute of Technology
2	Mr. Abhimanyu Singh Bisht	Manager	TLABS
3	Mr. Anirudh Suri	Co-Founder	India Internet Fund
4	Mr. Arvind Mathur	President	Indian Private Equity &Venture Capital Association
5	Mr. Deepak Gaur	Managing Director	Saif Partners
6	Prof. Dipakranjan Mal	Professor and Former Head Department of Chemistry	P. U. University of Agricultural Sciences Dharwad
7	Dr. Dipali Krishnakumar	Head of Department, Finance	Symboisis Centre for Management & Human Resource
8	Mr. Jaydeep Mandal	Founder and Managing Director	Aakar Innovations Pvt. Ltd
9	Prof. Krishnaraj	Professor and Head, Department of Agril in Microbiology.	P. U. University of Agricultural Sciences Dharwad
10	Mr. Mahesh Krovvidi	CEO	National Design Business Incubator of National Institute ofDesign, Ahmedabad
11	Mr. Ninad Bhave	PGPX Student	India Institute of Management, Ahmedabad
12	Prof. P. R. Vavia	Professor of Pharmaceutics	Institute of Chemical Technology, Mumbai
13	Ms. Purnima Tripathi	PGPX Student	India Institute of Management, Ahmedabad
14	Prof. Ramakrishna Sen	Professor of Biotechnology & Vice- Chairman (GATE -JAM)	Indian Institute of Technology, Kharagpur
15	Mr. Sandeep Sinha	Co-founder and Managing Partner	Lumis Partners (IVCA)
16	Mr. Sandro Stephen	Head	North & South India Operations at Indian Angel Network (IAN)

17	Dr. Satyabrata Jit	Professor	Department of Electronics Engineering, Indian Institute of Technology (BHU)
18	Prof. Shiban Kak	Former Vice Chancellor	Jaypee University of Information Technology, Solan
19	Mr. Siddhant Singh Baid	Head	Incubator at Indian Angel Network
20	Prof. Siddhartha Das	Professor Department of Metallurgical and Materials Engineering and Executive Advisor.	STEP Indian Institute of Technology, Kharagpur
21	Prof. Somarajan	Executive Consultant, Foundation of Innovation & Technology Transfer (FITT).	Indian Institute of Technology, Delhi
22	Mr. T. Chandrasekhar	Scientist	Technology Information Forecasting & Assessment Council TIFAC) under Department of Science & Technology (DST),
23	Mr. Manjunath M.S	Leader- Innovation	Ingersoll Rand
24	Ms. Richa Aggarwal	PGPX Student	India Institute of Management, Ahmedabad
25	Dr. Suresh Kumar	General Manager	Science & Technology Entrepreneurial Park (STEP), Coimbatore

Online Jury Member Profiles

Mr. A. Balachandran

General Manager
Vellore Institute of Technology

Balachandran is a Mechanical Engineer by training and also holds an MBA. He has over 25 years of Techno-commercial experience and is in-charge of VIT-TBI from its inception in the year 2003. He mentored and assisted a number of start-ups and many innovators in the last 12 years. He has been coordinating a number of innovation and entrepreneurship programs (training, funding and capacity development) with the support of various departments of Government of India. He successfully executed a project for incubation capacity building initiatives under World Banks' Information Development program in 2006-07. He coordinated a 'Youth Entrepreneurship Skills Development Initiative' project supported by UNIDO for building entrepreneurship and incubation capacity building targeting four West African countries in 2012. Balachandran is a certified mentor in the National Entrepreneurship Network (NEN). He is also certified infoDev (The World Bank Group) Business Incubation Trainer. He is passionate about Technology start-ups, grooming students and assisting innovators.

Mr. Abhimanyu Singh Bisht

Manager
TLABS

Abhimanyu has been working with Indian technology start-ups for more than 5 years, whereby he worked for the start up eco-system at large as well as operating individually with start-ups. Currently he is part of TLabs which is the leading tech start up accelerator in India backed by Times of India group. He handles marketing, branding and partnerships for TLabs along with scouting for start-ups. Before this, he worked for India's IT trade body, NASSCOM for 2+ years towards the launch, shaping and execution of the nation's biggest entrepreneurship program called 10,000 Start-ups focusing towards evangelizing technology entrepreneurship, building capabilities of tech-entrepreneurs & investments in start-ups. Prior to that, worked for a non-profit organization in cluster development for 2+ years under a Govt. of India supported project to Promote Innovation in the IT cluster of National Capital Region, individually assisting more than 100 start-ups. He also worked for around 2 years in customer relationship management and business development within the Indian banking industry.

Mr. Anirudh Suri

Co-Founder
India Internet Fund

He is the founding partner of the India Internet Fund, and heads the Delhi and Mumbai offices for IIF Advisors. He has, previously, served as a policy advisor to the Minister of State for Communications and Technology in the Government of India. Prior to that, he worked at McKinsey & Company and Goldman Sachs, serving clients in the consumer, retail, healthcare, energy and the public sectors. Named the Most Promising Young Indian Professional by India Empire and a Goldman Sachs Global Leader by the Goldman Sachs Foundation,

Anirudh has also been the recipient of the Carnegie Endowment Fellowship, the C.V. Starr Fellowship and the Singapore Airlines Scholarship. Anirudh pursued a joint MBA-MPA degree at the Harvard Kennedy School of Government and the Wharton School at the University of Pennsylvania. He graduated from Haverford College with a BA in Economics and Political Science. Anirudh's areas of expertise include Tech, mobile, Internet, growth hacking, and product sevelopment.

Mr. Deepak Gaur

Managing Director
Saif Partners

Prior to joining SAIF in 2006, Deepak Gaur was a consultant with McKinsey & Company, where he focused in consumer products/services, IT, telecom, and the automotive sector. He has also worked at IBM Global Services in their Telecom and Media

Services division. Deepak was awarded the Chairman's Gold Medal at IIM Lucknow and has a B.Tech in Mechanical Engineering from IIT Kanpur.

Prof. Dipakranjan Mal

Professor & Former Head Department of Chemistry
Science &Technology Entrepreneurs Park (STEP),
Indian Institute of Technology, Kharagpur

Dipakranjan, born in 1952, received his BSc-Hons (1972) and MSc (1975) degrees in Chemistry from the Calcutta University. In 1981, he received PhD degree from the University of Missouri at Kansas City, USA. After a postdoctoral stint (1981-1984) at Oregon Graduate Center, USA, he joined the position of a lecturer at Bose Institute, Kolkata. Since 1987, he has been with the department of chemistry, Indian Institute of Technology Kharagpur and was the head of the department for three years. His research interests are development of synthesis of angucyclines, anthracyclines, furoisocoumarins, carbazoles, and isobenzofuranone natural products. He has supervised 25 doctoral students for their PhD degrees and published over 113 research publications including 3 book chapters and 4 reviews. He has developed a 40-lecture video course on 'Heterocyclic Chemistry Exasperation. He received the honor certificate of Phi Kappa Phi, USA, in 1978. He is a life member of the Indian Chemical Society and the Chemical Research Society of India.

Dr. Dipali Krishnakumar

Head of Department, Finance
Symbiosis Center for Management and Human Resource

A CA, MBA & PhD in Finance with more than 16 years of experience, Dr. Dipali demonstrates expertise in business analysis in the Banking and Financial Services domain, corporate finance & strategy, and econometrics & data analytics. She has worked with renowned organizations such as HSBC, JPMorgan, ICICI, S.B. Billimoria, Motorola, and Symbiosis. She has done her Doctoral research in cross border acquisitions and specializes in mergers and acquisitions analysis including financial modelling, deal accretion, dilution analysis, and post-acquisition performance analysis.

Mr. Jaydeep Mandal

Founder & Managing Director
Aakar Innovations Pvt. Ltd

A Social Entrepreneur by heart and an engineer and MBA in Innovations and Entrepreneurship, Jaydeep founded Aakar Innovations in 2011 as a for-profit enterprise with a mission to provide rural Indian women with affordable and effective sanitary protection and sustainable livelihood opportunities by setting up village level micro-enterprises which are owned and operated by women to produce the sanitary pads. In 2013, Aakar Innovations became the first company in India to provide ~100% compostable sanitary napkins, known as Anandi. Aakar Innovations' has partnered with the Govt. of Gujarat, Govt. of Chhattisgarh, Telengana, and has an impressive list of CSR clients like TATA International, IL&FS, JSW Foundation, Manipal Foundation, Rotary Club and NGOs include Barefoot College, Development Alternatives among others. Jaydeep has 10 years of experience in rural innovation and micro-enterprise development as a consultant/advisor with several government, UN organizations & international NGOs like Aga Khan Foundation. He has been recognized by Govt. of India, President of India, CII, FICCI, Stanford University, University of Texus, TIE-USA & INDIA, USAID, SOCAP-USA, JIII-Japan, IUSSTF, Lokheed Martin, SIFE (now Enactus), IIMs, ISB for his innovations and work in the development sector.

Prof. Krishnaraj

Professor & Head Department of Agril in Microbiology, College of Agriculture (Vijayapur),
University of Agricultural Sciences (Agricultural)
P. U. University of Agricultural Sciences Dharwad

Krishnaraj P U is, currently, Professor and Head, Department of Agril in Microbiology at College of Agriculture (Vijayapura), University of Agricultural Sciences (Dharwad). Earlier, he headed the Department of Biotechnology and the Institute of Agri Biotechnology at University of Agricultural Sciences, Dharwad. His experience of working in the industry is a short stint at Biocon India Limited, Bangalore. Krishnaraj completed his Ph.D. at Indian Agricultural Research Institute, New Delhi and his Masters at University of Agricultural Sciences, Bangalore. He was a Visiting Scientist at Alfred University, USA. His research interests include the molecular plant microbe interactions, metagenomics of soil, insect gut and fermented foods, and applications of microbes for improving plant growth and nutrient uptake. Having keen interest in encouraging young entrepreneurs, during the past few years, he has been active in developing incubation facility and the University Innovation Centre at University of Agricultural Sciences, Dharwad and at present, mentors the Innovation cell at College of Agriculture, Vijayapura. He is serving on the Expert Panel on Bio-incubators of BIRAC, Department of Biotechnology, New Delhi and member of academic bodies of a couple of Institutions including MPKV, Rahuri. He is a member of Institutional Bio-safety Committees which is involved in regulatory issues in research in biotechnological areas. He is steering a couple of research programmes in the area of molecular microbiology with extra mural grants from ICAR, New Delhi.

Mr. Mahesh Krovvidi

CEO
National Design Business Incubator of Design, Ahmedabad

He is a Technical Management and Industrial Design Professional with 36 years of successful leadership career across India and USA. Lead world-renowned Business Management teams, which include, PwC and Deloitte in the US for over five years. He did M.Tech in Production Engineering, IIT-Bombay (1978-80) and B.Tech in Mechanical REC-Warangal (1973.78). His domain expertise includes innovations, engineering, manufacturing, industrial and public design. He turned around the incubator from two Design Entrepreneurs to 55+ start-ups engaging 250 designers/engineers. World Bank initiative 'InfoDev' Certified Trainer to train Incubator Managers. He manages USD 2.50m venture fund supported by Ministry of Commerce & Industry, Government of India. He is a Founding and Expert Member of India Design Council, constituted by Ministry of Commerce & Industries, Government of India. He was TePP Screening Committee Member (2007-.2010), a national-level program of DSIR, Ministry of Science & Technology, Government of India to support prototyping and commercializing innovations.

Mr. Ninad Bhave

PGPX Student
Indian Institute of Management, Ahmedabad

Mr. Bhave is a current student in the PGPX programme at IIM Ahmedabad. Earlier he spent 8 years in the renewable energy and sustainability industries in India and the United States. In his latest role, Ninad was a country manager for Dalian East, a Chinese renewable energy specialist, and helped them setup and scale their operations in India. He has worked in a wide range of roles, including design engineering, project management, business development, vertical head and in-house strategy consultant. In his spare time Ninad likes to mentor and train students at various levels, including primary education for underprivileged children, basic adult education and all levels upto providing insights or guidance on post-graduate engineering projects. Till date he has personally trained over dozens of people through direct mentorship / sponsorship or as an occasional/peripheral guide. Ninad holds a Masters degree in Mechanical Engineering from San Jose State University, USA.

Prof. P. R. Vavia

Professor of Pharmaceutics
Institute of Chemical Technology, Mumbai

Prof. P. R. Vavia is Professor in Pharmaceutics at Institute of Chemical Technology, Mumbai. He earned his B.Pharm, M.Pharm and Ph.D. from Mumbai University in 1985, 1987 and 1991 respective years. He has more than 25 years of teaching experience to undergraduate, post-graduate and doctoral students. He has more than 122 peer reviewed scientific publications in national and international journals. Prof. Vavia has more than 1537 citations and H-index of 27. He has total 37 complete patent publications, 15 provisional patent applications and 1 granted patent in the area of drug delivery technology. His valuable inputs as academician, researcher and versatile administrator were always acknowledged by various prestigious awards like, to name a few, "COSAT (Corporate of Science and Technology) Award" of Johnson & Johnson, USA, 2001; "U.P. Government National Award" for outstanding work done in the area of interaction with Industries, 2005; "Best Teacher's Award" University Institute of Chemical Technology, 2007 2010, 2012 and 2014; "Distinguish Teacher Award" Maharashtra Pharmacy Association, 2009; "Incentives to Meritorious Teachers", Dr. K. H. Gharda Reward, 2009; VASVIK Award in the category of Biological Sciences & Technology, for developing the Novel Drug Delivery Systems, Synthesis and application of novel polymers and excipients and targeted drug delivery in cancer treatment, 2015. Till date more than 25 technologies are successfully commercialized. To name a few, Fentanyl Transdermal Patch (FENSTUD), Rusan Pvt. Ltd, Self microemulsifying drug delivery system of Cyclosporin (PROMUNER) by Mega Life sciences, Combination drug product of Metformine Acarbose Tablet (GLUCOBAY M 25 & GLUCOBAY M 50) by Bayer Pvt. Ltd, etc.

Ms. Purnima Tripathi

PGPX Student
Indian Institute of Management, Ahmedabad

Purnima is presently pursuing her Executive MBA from IIM Ahmedabad. Before joining PGPX program, she was working as Deputy Manager (Research and Development division) in Maruti Suzuki India Limited. Her journey at Maruti Suzuki started as a Graduate Engineer Trainee in 2006, after graduating in Mechanical and Automation Engineering from Indira Gandhi Technical University, Delhi.

The professional years spent in India's No 1 Automobile company gave her an opportunity to learn and develop insights about the various operational nuances involved in the automotive industry. She also got the opportunity to visit Suzuki Motor Corporation, Japan on various occasions and work with International suppliers from Europe, South East Asia in particular, which has helped her to understand multicultural environment more closely. Ideas burning with novelty and innovation attract her big time. Even at her previous organisation she was an active participant in developing a culture of innovation. She is also an innovator of a patent (due grant). On a personal front, she loves to draw inspiration from common people and have keen interest in reading books and theatre. She was part of a Delhi based theatre group "Siege within". Shel truly believe in "Attitude is a little thing that makes a big difference"

Prof. Ramakrishna Sen

Professor of Biotechnology & Vice-Chairman (GATE-JAM)
Indian Institute Technology, Kharagpur

He served as a Fulbright Visiting Faculty in the Columbia University, New York. He has been engaged in R&D activities in the areas of Energy & Environment and Healthcare, with a focus on process and product development for anticancer bio-molecules; marine bacterial bio-surfactants; lignocellulosic bio-ethanol; micro algal bio-fuel with concomitant CO2 sequestration from flue gas coupled with wastewater treatment in a bio-refinery. So far, he guided 13 PhDs and 30 Masters that received their degrees. Right now, he is guiding 10 PhDs and 5 Masters. He has about 151 international publications in journals, books and conference proceedings and 12 patent applications to his credit. He published a book 'Bio-surfactants' (Springer, USA). He has international collaborations with UC Berkeley; UFRJ, Brazil; UoM, Australia and University of Minho, Portugal. Dr. Sen was awarded the Fulbright Visiting Faculty Fellowship (2013–14); UKIERI Grant for Exchange Visits (2007) and 2nd prize in 3rd National Awards for Technology Innovation in Petrochemicals & Downstream Plastic Processing Industries (2012). He is a life member of IIChE and member of European and Asian 67 Federations of Biotechnology. He is now administering as Vice-Chairman (GATE-JAM), IIT Kharagpur.

Mr. Sandeep Sinha

Co-founder and Managing Partner
Lumis Partners (IVCA)

At Lumis, Sandeep brings an entrepreneur spirit, a hands-on investing experience in India, and over 15 years of global operating experience. Sandeep is focused on building portfolio across higher education segment and human capital services in emerging markets. He is an active member in this sector and leads several activities across various public/private organizations in this ecosystem.

He began his professional career with Technology Management Leadership program at GE. His prior experiences include quality and technology leadership roles across various businesses of GE; and senior operating positions at 3Com.

Sandeep completed his undergraduate studies in Computer Science from the Delhi Institute of Technology followed by post-graduate program from the London School of Economics.

Mr. Sandro Stephen

Head
North & South India Operations at Indian Angel Network (IAN)

India's first & Asia's largest group of 350 business angels, comprising of successful entrepreneurs and CEOs from 10 countries and having invested in over 90 companies across 7 countries. Sandro, active in the Indian entrepreneurial eco-system. He is handling deal sourcing and reach out to start-up entrepreneurs across India, which includes, structure and process development, deal management, investor relations, partnerships and outreach. His expertise lies in entrepreneur interaction: Helping entrepreneurs articulate their vision and value proposition to improve their chances of getting shortlisted by investors. Also, in helping entrepreneurs not shortlisted, to understand the reasons for the decline, so they can change their plan to improve their chances for success. He has partnered with and supported many big and small ecosystem players, including Nasscom, 10K startup, TIE, VC Circle, NEN, CII and Tlab to name a few.

Dr. Satyabrata Jit

Professor
Department of Electronics Engineering, Indian Institute of Technology (BHU)

Professor, Department of Electronics Engineering, Indian Institute of Technology (BHU) Prof. Jit has earned his B.E, M.Tech and PhD. degrees from the University of Calcutta, IIT Kanpur and IT-BHU in 1993, 1995 and 2002 respectively. He has supervised 11 Ph.D. theses and more then 30 master's theses; and has published more than 140 research articles, and 04 books. He is the recipients 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 in 2011. He has worked as the BOYSCAST fellow in the Max-Born-Institute, Berlin, Germany during Sept.-Dec, 2011. Prof. Jit has served as the Coordinator, Computer Centre, BHU from February 2012 to March 2014 and, as the Chairperson, Senate Post Graduate Committee, IIT (BHU) for 2013-14 & 2014-15 academic sessions. He has served as an expert member of the NBA and UGC, New Delhi. Prof. Jit is a member of the BoG, HBTI Kanpur. He has worked as an expert of the BoS of many institutions including NIT Delhi and SVNIT Surat. At present, he is the Professor and Head of Department of Electronics Engineering, IIT (BHU), Varanasi. Prof. Jit is the Fellow, IETE (India) and Senior Member, IEEE (USA).

Prof. Shiban Kak

Former Vice Chancellor
Jaypee University of Information Technology, Solan

Born in Kashmir, Shiban joined IT-BHU as a faculty in 1971 and became Reader in 1978 and Professor of Electronics Engineering in 1985 and has held many other responsibilities as Director Computer Centre, Chairman of Telecom BHU and the President of IT Gymkhana.

Since his student days he was active in the Engineering Model making activity and learnt how theoretical knowledge is applied to 69 solve real world problems, he honed his engineering skills and translated many ideas into active products that have won him many awards, prizes and two patents.

As a faculty member, he has established Communication Systems Lab (1973), Optical Communication Lab (1978), Digital Communication Lab (1979) and was also instrumental in starting the M.Tech Program (1979) in Communication Systems Engineering. He has completed six R&D projects for DAE, AICTE, DRDO, MIT and ISRO as principal investigator. He has contributed to various electronic product designs, technology reviews and helped many Govt. & private industries.

Prof. Kak was Director of Jaypee Institute of Information Technology, NOIDA (2003-2006). He has been an Independent Director on the BSNL Board (2008-2011). He was appointed as the Vice Chancellor of Choudhry Charan Singh University, Meerut, 2008 and then VC of Mahamaya Technical University, Noida (2010-2013). He then joined the Jaypee University of Information Technology, Solan as VC (2014-2015) and is now working as a freelancer for promoting skills development using innovative techniques for training and certification.

Mr. Siddhant Singh Baid

Head
Incubator at Indian Angel Network

In Siddharth's own words, "At IAN we believe that early stage businesses require more than just money to succeed. They require close mentoring and inputs on strategy as well as execution. The incubator helps entrepreneurs to convert their ideas in becoming successful and profitable ventures by supporting them in business planning, mentoring, recruiting their top team, commercializing their technologies, developing their products, getting early engagement and customer validations from the market, transfer of technologies, getting early seed funding, help in forging partnerships at the national and global level, advice on intellectual property, training and development and many other things."

Siddharth has worked in commercial and corporate banking in various capacities; with HSBC Bank as VP Commercial Banking, Yes Bank as Sr. Manager, Commercial Banking and HDFC Bank as Manager, Emerging Corporates Group. As part of his work in Corporate Banking, Siddhart was responsible for managing the end to end requirement for corporate w.r.t banking needs including assessment of corporates, credit proposals, auditing, documentation - pre-disbursement & post disbursement, Funding, Cross Sell Products - CMS, Treasury, Salary Accounts, Trade Finance, etc.

Prof. Siddhartha Das

Professor Department of Metallurgical &
Materials Engineering & Executive Advisor, STEP Indian Institute
STEP Indian Institute of Technology, Kharagpur

Dr. Siddhartha Das is a Professor of the Department of Metallurgical and Materials Engineering and the Executive Advisor to the Science and Technology Entrepreneur's Park (STEP) of the IIT Kharagpur. He received his BE degree in Metallurgical Engineering from the University of Calcutta. He received both MS and PhD degrees in Metallurgical Engineering from the University of Illinois at Urbana-Champaign.

Dr. Das is the recipient of several awards including MRSI Medal by the Materials Research Society of India, Vidya Varati Award by the Indian Institute of Metals, Indranil Award of Metallurgy by Mining, Geological, and Metallurgical Institute of India, etc. He is also the member of Powder Metallurgy Association of India, Indian Institute of Metals, Materials Research Society of India, Tau Beta Pi, a national engineering honor society, U.S.A., and Sigma Xi, a national scientific research society, U.S.A.

Prof. Somarajan

Executive Consultant, Foundation of Innovation & Technology Transfer (FITT)
Indian Institute of Technology, Delhi

A graduate in mechanical engineering from IIT Delhi and post graduate in management from IIM Bangalore, P Somarajan has over 25 years of experience in the industry both in India and abroad. After a rich and versatile global experience with reputed multinationals that are market leaders in manufacturing and engineering, he turned to consulting in strategic management, performance optimisation and technology domains. He has advised global corporates in both India and abroad. He is an Executive Consultant at the Foundation of Innovation and Technology Transfer (FITT) of IIT Delhi.

Mr. T. Chandrasekhar Scientist

Technology Information Forecasting & Assessment Council
(TIFAC) under Department of Science & Technology (DST),

Mr.T. Chandrassekhar 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 of 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, with the then Chairman TIFAC, Late Dr. A.P.J. Abdul Kalam, he coordinated Nation's 1st long term national technology forecasting exercise "Technology Vision for India upto 2020" ("Vision 2020") and follow-up actions.

During 1998-2011, he coordinated 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. Currently, his efforts are focussed 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, and Turkey.

Mr. Manjunath M.S

Leader-Innovation
Ingersoll Rand

Popularly known as MMS in the business fraternity, he is a graduate Electrical Engineer from the Karnatak University with over 30 years of industrial Marketing, Product Management & Innovation experience. MMS joined Ingersoll Rand from Rinac India Limited, where he held several positions in Product Management and Marketing and left the organization as Vice President Exports. He was responsible for several key projects and clients like CocoCola, Pepsi, Mc Cain's, KFC, Novartis, etc in several geographies like East Africa, India, Bangladesh, Sri Lanka & the Middle East.

His biggest contribution at Rinac was the innovation of the Prefabricated Clean-zone Construction systems which were first introduced in India by him for large constructions of Food, Pharmaceutical and Auto industry. These paved way for India to develop and install Clean Room constructions that were manufactured at factory and installed at site. These brought in a multimillion dollar business to his division and also provided world class Modular construction exclusively suited to regulatory requirements of the USFDA and the EU GMP. Working with several companies like Delphi, Pepsi

and Coke & Novartis he developed a keen interest in understanding the product and its ecosystem and their interpersonal relationships that can be leveraged to offer innovative solutions to the asset owners. MMS has a deep experience and understanding of the domains of Food and Pharmaceuticals where Temperature Management and attendant Air Quality Management solutions are priority for profitable business. At Ingersoll Rand he has successfully introduced an innovative conceptof Pathogen controlled Air Conditioning of Chicken Hatcheries to boost productivity and reduce Chicken mortality. The first pilot project was commissioned in January 2014 in India. has been and continues to be a key speaker at several seminars and conferences for the subject of Temperature Management and Cold Chain in India. He has spoken at several seminars in India & Sri Lanka under the aegis of ASHRAE, CII, GCCA etc.

He is a member of the Association of Ammonia Refrigeration affiliated to the IIAR (USA). He is also on the Standing Committee of the Confederation Of Indian Industries (CII) for Cold Chain Standards and Case Studies. MMS continues to work on Innovation projects for Ingersoll Rand in the geographies of China, Europe & Middle East. MMS attends meetings of the Indo US Business Council for Agro related subjects and also on the AMCHAM calls on similar subjects for policy analysis and recommendations. He has authored the Innovative Pan India Micro Cold chain that addresses Urban & Rural needs within one solution for Food & Healthcare dispensation. A passion for listening and understanding customer concerns, a discipline for converting unmet needs to profitable business and appreciating the needs of the Customer's Customer are what make MMS closer to the action on the ground.

Ms. Richa Aggarwal

PGPX Student
India Institute of Management, Ahmedabad

Richa Aggarwal is a seasoned infrastructure professional. Currently pursuing her post graduation in Management from IIM Ahemdabad, she has worked with Tata Engineers for ~7 years prior to that. During her time at TCE, she has lead a variety of projects, across nuclear, power, ports, and aviation sectors. Richa completed her Bachelor's of Architecture from Chandigarh College of Architecture in 2008. She has extensive experience in project and account management, had managed small-large teams across planning and execution of various projects. She also takes active interest in sustainable buildings and holds and GRIHA certifications. At IIM Ahemdabad, she is also an active member of the Profile Committee and Cultural Committee. In the last one year, she has been consulting for Forum for Industry Interaction (FII) as well.

Dr. Suresh Kumar

General Manager
Science & Technology Entrepreneurial Park (STEP), Coimbatore

Dr. Suresh Kumar has been responsible for managing the incubation facility, handholding start-ups, managing the seed fund support system, coordinating the Outreach Centre activities for promoting innovations and entrepreneurship. He handles the Secretariat of Asia Pacific Incubation Network (APIN) – an initiative supported by infoDev, World Bank & Department of Science & Technology, Government of India. The network has about 106 incubators as members across 20 countries. He is certified as Business Incubation Trainer by infoDev, The World Bank Group and a mentor in the National Entrepreneurship Network (NEN). He has participated in various international programs/workshops held at USA, Australia, China, Finland, Brazil, South Africa, Japan, Taiwan, Malaysia and Thailand. Suresh Kumar holds an engineering degree in Mechanical and a PhD in Management.

8. i3 PARTNERS

Following are the esteemed partners of the India Innovation Initiative 2015:

Advancing Societies through "Technology Convergence" and "Collaborative Approaches"

Converge. Create. Change

Valluri Technology Accelerators works towards converging technologies through collaborative approaches and creating solutions that drive positive changes in societies. It believes that the core competency approach where organizations have had leadership with respect to a technology, product, service or market access is no longer valid. With technologies changing and innovations getting launched at a feverish pace, the approach of creating value needs to change. Additionally, markets continue to get transparent due to access of real time data analytics. Also as the world grapples with climate change, the industrial world will need to become extremely efficient in terms of resource utilization and productivity. This can be accomplished through **"Collaborative Approaches"** and **"Technology Convergence"** across domains. This concept will have a positive impact by driving engagement in the society and creating responsible solutions for advancement.

The intent of **Valluri Technology Accelerators** is to create and innovate sustainable low cost solutions through technology convergence and collaborative approaches and addressing societal needs in the areas of:

- Energy
- Water
- Healthcare
- Environment, Pollution
- Waste
- Security
- Transportation & Mobility

Today a number of technologies exist around the world. It is the endeavor of **Valluri Technology Accelerators** to bring in domain expertise from various global and national corporations to build processes and technologies which can be converged to provide solutions for societies and governments. ICT provides the backbone to create the necessary data driven solutions. These practices can be applied to brown field (existing) cities, Industrial Units or green field (to be built) infrastructure.

In emerging economies, where the consumption patterns of an aspiring generation will become gargantuan, industrial efficiency and productivity will become extremely important. Over the next two decades we will witness a sophisticated manufacturing base emerging in the country. This will be based on new material science, robotics, Machine & Artificial Intelligence and automation. IOT and big data will gain prominence. The outputs of the Industrial world will feed into platforms which will address the societal challenges. VTA will engage in creating such an eco-system and bridging the needs of a connected world.

Access to India's growth markets that demonstrate an increasing purchasing power will demand that the developed world offers clean technologies. Collaborations will allow new innovations to be developed for "bottom of the pyramid" markets. This will develop a **"Reverse Innovation Engine"**.

The solutions to support needs with these technologies must be **environmentally sustainable and socially responsible**. Organizations which are strong in technology, market access and people capabilities will undergo a major transformation over next 3-5 years. Disruptive technologies will become the norm and therefore it will be of paramount importance to build a "Convergent and a Collaborative"eco system.

The convergence approach will create new markets, solutions, products, new technologies that can be beneficial to emerging markets. VTA intends to play an active part in this transformation.

Solutions for Building Smart Cities through "Technology Convergence" & "Collaborative Approaches"

Valluri Technology Accelerators, along with its partners can provide innovative and sustainable low cost solutions through convergence and collaborative approaches in the following areas:

1) Treatment of Water & Sewerage
2) Converting Waste to Energy
3) Environment & Pollution Monitoring
4) Energy (Renewables) & Grid Connectivity
5) Land & Carrying Capacity Assessment
6) Smart Measurement Solutions using ICT in the areas of
    a. Water (Quality & Supply)
    b. Energy
    c. Lighting
    d. Parking
    e. Waste
    f. Health
    g. Earthquakes and Water Leaks
    h. Security
    I. Security
    j. Logistics'
    k. Industrial Controls
    l. Agricultural Productivity
    m. Animal Farming

Skill Development

Building Solutions for the above areas on a unified platform is necessary so that the principles of circular economy can be applied. In addition, a converged "data analytics" information tool provides the user a unique ability to improve citizen services.

Also, skill development in this space will become a challenge as innovations will become faster than the ability to train people. **VTA** intends to engage in the process of training and skill upgradation.

Valluri Technology Accelerators has multiple global partnerships to develop such solutions. Some key Partners include the following Organizations:

GE (USA), VITO NV (Belgium), Jethro (Israel), Wipro (India), ESCI (India), STEPS (India), ICRISAT, BMSIT (Bangalore), Innovacer and others.

Indian Angel Network

Indian Angel Network is a network of Angel investors keen to invest in early stage businesses which have potential to create disproportionate value. The members of the Network are leaders in the Entrepreneurial Eco-System as they have had strong operational experience as CEOs or a background of creating new and Indian Angel Network Indian Angel Network is a network of Angel investors keen to invest in early stage businesses which have potential to create disproportionate value. The members of the Network are leaders in the Entrepreneurial Eco-System as they have had strong operational experience as CEOs or a background of creating new and successful ventures. They share a passion to create scale and value for start up ventures. Started in April 2006, the Indian Angel Network in addition to money provides constant access to high quality mentoring, vast networks and inputs on strategy as well as execution. The Network members, because of their background are better able to assess the potential and risks at the early stage. The network works through the mechanisms of deal flow, investment and mentoring provided by individual and institutional member investors to start-ups.

Web link: http://indianangelnetwork.com/

The Indian Private Equity & Venture Capital Association (IVCA)

Indian Venture Capital and Private Equity Association (IVCA) is a member based national

organization that represents venture capital and private equity firms, promotes the industry within India and throughout the world and encourages investment in high growth companies.

IVCA members comprise venture capital firms, institutional investors, banks, incubators, angel groups, corporate advisors, accountants, lawyers, government bodies, academic institutions and other service providers to the venture capital and private equity industry. Members represent most of the active venture capital and private equity firms in India. These firms provide capital for seed ventures, early stage companies, later stage expansion, and growth finance for management buyouts/buy-ins of established companies.

Web link: http://indiavca.org/

Indian Steps and Business Incubators' Association (ISBA)

The Indian STEP and Business Incubator Association (ISBA) was set up in 2004 as a registered professional body to promote business incubation in India. ISBA aims to promote business incubation activities in the country through exchange of information, sharing of experience, and other networking assistance among Indian Business Incubators, Science and Technology Entrepreneurs Parks (STEPs) and other related organizations engaged in the promotion of start-up enterprises.

Web link: http://www.isba.in/about-us+

Technology Information, Forecasting and Assessment Council – Technology Refinement and Marketing Program (TIFAC-TREMAP)

Technology Information, Forecasting and Assessment Council (TIFAC) is an autonomous organization set up in 1988 under the Department of Science & Technology to look ahead in technologies, assess the technology trajectories, and support technology innovation by network actions in select technology areas of national importance. In 1993, TIFAC embarked upon the major task of formulating a Technology Vision for the country in various emerging technology areas. The outcome of the Technology Vision 2020 exercise led to the set of 17 documents, including sixteen technology areas and one on services. The effort was a unique and pioneering exercise that involved more than 5,000 experts including scientists, technologists and corporate managers from academia, industry and the government. In 2009, TIFAC had initiated Technology Refinement and Marketing Programme (TREMAP), to work towards pushing the innovative technologies, up the commercialization cycle, towards market through a network of Technology Commercialization Facilitators (TCFs) and establishing an enabling ecosystem for the same. TREMAP is a unique program which is designed for supporting the country's innovation pool by pushing the innovative technologies from the prototype stage towards a viable commercial product through a network of Technology Commercialization Facilitators (TCFs). The programme provides opportunities for an early assessment of innovative technologies by identifying their market potential and provides the required support (marketing, operational and financial support) towards commercialization.

Web link:
http://www.tifac.org.in/index.php?option=com_content&view=frontpage&Itemid=1

The Indus Entrepreneurs (TiE Delhi-NCR)

TiE is a non-profit, global community which welcomes entrepreneurs from all over the world. They believe in the power of ideas to change the face of entrepreneurship and growing business through our five pillars; mentoring, networking, education, incubating and funding. TiE was founded in 1992

by a group of successful entrepreneurs and is currently the world's largest entrepreneurial organization out there. With programs like TiE Young Entrepreneurs (TYE) and Mentor Match, we are reaching out and fostering the next generation of entrepreneurs. TiE is a non-profit, global community welcoming entrepreneurs from all over the world. We believe in the power of ideas to change the face of entrepreneurship and growing business through our five pillars; mentoring, networking, education, incubating and funding. TiE was founded in 1992 by a group of successful entrepreneurs and is currently the world's largest entrepreneurial organization out there. With programs like TiE Young Entrepreneurs (TYE) and Mentor Match, we are reaching out and fostering the next generation of entrepreneurs.

Web link: http://delhi.tie.org/

Young Indians

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 which plays 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 realise the dream of a developed nation. Yi has around 2010 direct members in 38 chapters, and engages around 10,500 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 "International Engagements".

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 10,500 students.

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 centres 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 lacs 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 Asia Alliance of Young Entrepreneurs (CAAYE) which is a network of young entrepreneurs from the Commonwealth Asia region and the organizations that support them.

Web link: http://www.youngindians.net/

STEP IIT Kharagpur

The Science and Technology Entrepreneurs' Park (STEP) was established at IIT Kharagpur in Dec. 1986 with financial support from DST New Delhi, DST West Bengal, IDBI, IFCI, ICICI. Approval was accorded by DST on Aug.14, 1987. Operations commenced from Mar.1989. As per the mandate set by National Science and Technology

Entrepreneurship Development Board (NSTEDB), DST, New Delhi, STEP IIT Kharagpur has come a long way in promoting entrepreneurship by providing a conducive environment of nurturing and mentoring to the prospective entrepreneurs. STEP- IIT Kharagpur, works in complete harmony with the other incubation programmes like Technology Incubation and Entrepreneurship Training Society (TIETS) and Technology Business Incubation (TBI) of the host institute (Indian Institute of Technology, Kharagpur) and acts as a conduit between IIT and the external world to facilitate technology transfer as well as to convert research outcomes of entrepreneurs to commercially viable propositions.

Web link: http://www.step-iit.org/index.html

Forum for Industry Interactions, IIM-A

The Forum for Industry Interaction (FII) is India's largest Student Consulting body, based out of the Indian Institute of Management, Ahmedabad (IIM-A). The FII members include participants from its flagship two-year post graduate program (PGP), post graduate program in food and agribusiness management (PGP-FABM), post graduate program for executives (PGP-X) and the doctoral program (FPM).

At its core, FII aims to form successful partnerships between the students and industries. They strive to provide innovative and pragmatic solutions to domestic and international firms, start-ups and non-profit organizations in diverse sectors. Clients also benefit from access to IIM-A's comprehensive knowledge resources, library and databases. FII follows its proven project management model for problem scoping, feedback and delivery. The client is involved in all stages of the project from selection of project teams to project monitoring and final delivery. Most projects are structured to take 3-4 months to complete and are mentored by the world class IIMA faculty members. In the past, they have worked with marquee companies like GE, Amazon, Saint Gobain and CISCO in activities such as market entry, market research, pricing strategy, marketing strategy, sourcing and analytical data modelling.

Web link: http://www.iimafii.org/

8.1 i3 PROMOTORS

सत्यमेव जयते
Department of
Science & Technology
Government of India

Department of Science & Technology (DST)

was established in May 1971, with the objective of promoting new areas of Science & Technology and to play the role of a nodal department for organising, coordinating and promoting S&T activities in the country.

1 i) Formulation of policy statements & guidelines

ii)Co-ordination of areas of Science & Technology in which a number of Institutions & Departments have interests and capabilities

2 i) Support to basic and applied research in National Institutions ii) Support minimum Infrastructural facilities for Testing & Instrumentation

3 Technology Development & Commercialization - Technology Development Board

4 Autonomous Research Institutions

5 Fostering International Cooperation in S&T

6 Socially oriented S&T interventions for rural & weaker sections

7 Support Science & Technology Entrepreneurship Development for promotion of knowledge Based Technology Driven Entrepreneurs

8 Popularisation of Science & Technology

9 Promotion and Development of S&T in States

10 Scientific surveys and services through Survey of India and National Atlas and Thematic Mapping Organisation (NATMO)

11 Management of Information Systems for Science & Technology

Web link: http://www.dst.gov.in/

All Indian Council for Technical Education, Government of India

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. The Education Commission of 1964.popularly known as Kothari Commission after the name of its Chairman, made the recommended the setting up of a statutory body for the proper administration of technical education with the mandate "To ensure the pursuit of the highest standards at the first degree and post-graduate levels, and to provide on adequate machinery with the national and professional concern with the future development at these levels, we have recommended the setting up of a UGC-type organisation, industry and concerned Ministries. This body should have a full-time chairman, and funds should be allotted to it on a block basis."

In view of the above, AICTE became a statutory body through an Act of Parliament 52, in 1987. The Council, i.e. AICTE was established with a view to the proper planning and co-ordinated development of the technical education system throughout the country, the promotion of qualitative improvement of such education in relation to planned quantitative growth and the regulation and proper maintenance of norms and standards in the technical education system for matters connected therewith. Technical education was defined as programmes of education, research and

training in engineering, technology, architecture, town planning, management, pharmacy and applied arts and crafts and such other programmes or areas as the Central Government may, in consultation with the Council, by notification in the official Gazette, declare. The Act also laid down the powers, functions and structure of the AICTE.

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.

Web link: http://www.aicte-india.org/

Confederation of Indian Industry

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 7900 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.

In its 120th year of service to the nation, the CII theme of "Build India- Invest in Development, A Shared Responsibility", reiterates Industry's role and responsibility as a partner in national development. The focus is on four key enablers: Facilitating Growth and Competitiveness, Promoting Infrastructure Investments, Developing Human Capital, and Encouraging Social Development.

With 66 offices, including 9 Centres of Excellence, in India, and 8 overseas offices in Australia, Bahrain, China, Egypt, France, Singapore, UK, and USA, as well as institutional partnerships with 312 counterpart organizations in 106 countries, CII serves as a reference point for Indian industry and the international business community.

Web link: http://www.cii.in/

9. ANNEXURE

Annexure 1: Final shortlist of 76 innovations for National Fair & Awards Ceremony India Innovation Initiative 2015

S. No.	Application ID	Name	Focus Area	Invention Title	Profession/Occupation
1	MahHealDr.2600	Dr. Vandana Bharat Patravale, Miss Priyanka Suresh Prabhu, Soniya Jain,	Healthcare	Targeted Nanocarriers for Parenteral Treatment of Malaria	Professor of Pharmaceutics; Senior Research Fellow; Senior Research Fellow
2	KarMobiNis3666	Nishanth	Mobility	Self Stabilizing Wheel Chair	Student
3	TamElecBha2668	Bharatheeswaran.KTM	Electronics and PCB	Overload Safety Automation in two Wheelers	Student
4	TamElecKUM2877	Kumari Shailendu, P.padmasri	Electronics and PCB	Computer-Vision Based Collision Avoidance for UAVs	2 Students BE (EEE) Final Year;
5	MahProdDr 1635	Dr Amol Diwakar Kadu	Product and Services	An Eyewear to Provide the Disfigured Eye Resemble Normal Eye in Appearance	Doctor
6	TamVig2446	Vignesh. N.S; Sasi Kumar.R; Kamesh.S; Jagathish Kumar.R; Arun Kumar.R	Others	Design and Fabrication of Underwater Robot	5 Students
7	TamHerbS. 1982	S. Merish; Thomas M.Walter	Herbal	Trans-Dermal Herbal Plaster for Fever	Medical Student; Asst. Professor
8	MahElecbha3017	Bharati Sayankar	Electronics and PCB	Device-Free Indoor Positioning System Using Visible Light Led	Assistant Professor
9	TamEnerRAM2626	Rampradheep G S	Energy	Production of Electricity from Cement Matrix Cake in-built with Poly - Ethylene Glycol (PEG) As an Internal Curing Agent	Assistant Professor
10	TamSociSAN2099	Santhoshkumar K Srinath D	Social	Smart Assistant for Disabled Patients using EMG	Student
11	UttElecCHA1552	Chandan Singh	Electronics and PCB	Real Time Smart Accessory to Avoid Various types of Roads Accident	Student
12	TamMobisha1703	Shafeekkur Rahman; Siva.M ; Sree Vignesh.S.M	Mobility	Anti Theft Wheel Locking System	3 Students

13	TamMAN3315	Manivannan S	Electronics and PCB	Cable to Transfer Charge and Data Between Mobile Phones	CEO of Chennai Instruments; Partner in Chennai Instruments; Partner in Chennai Instruments; Partner in Chennai Instruments
14	GujSociviv2497	Vivek Vyas	Social	India's 1st Tribute Portal Shradhanjali.com	Entrepreneur
15	TamMobisha2801	Shamli B	Mobility	Android Application Based GSM Power Management and Conservation in Buildings	Student
16	TamMobiA.S2114	A.Sahaya Grinspan; Agrawal Jitesh; S. Parthiban; Dr. Sathya Prasad Mangalaramanan	Mobility	CLASSIK – Creation of Lift Axle Suspension System with Indian Know-how	Div. Manager; Asst. Manager; Div. Manager, Ashok Leyland Technical Centre.; General Manager, Asho
17	MahSocivai3015	Vaishali Tehre; Koutubh Gandhare; Chetan Malode; Akshay Ingole; Pallavi Pampattiwar	Social	Design of Automized Inspection Vehicle for Rto	Assistant Professor; 4 Students
18	KerElecLIB1960	Libin Varghese; Mebin Joseph	Electronics and PCB	Vidyuth Mithra: A Multi Purpose Solar Powered Protection Device from Electrocution	2 Students
19	MahProdNAM2438	Nambiar Rohitkrishna Rajendra; Omkar Shirish Dhande; Pradeepkumar C Dhage; Dr.Krishna k Warhade	Product and Services	Integrated Vitals Monitoring System with Pc-based Display And Data Logging.	2 Students; Assistant Professor; Professor Dean R&D;
20	TamElecT S1910	T Suresh; Veerakumar Natarajan; Srinath Prasad; Siddhartha Surya	Electronics and PCB	Smart G-Shoes	Professor ; 3 Students
21	TamElecKar3014	Karthikeyan.D.R,Bharathkumar.P,Yuvaraj.S	Electronics and PCB	Aadhar Card Voting	3 Students
22	MadMateSuy1970	Suyash Kamal Soni; Priya Fuskelay;	Materials	Advanced Pyrotechnical Missile Launcher	2 Students
23	TamAgriDha1558	Dhashwanth Srinivas G; RM.Arunachalam; M.Saravana Mohanv; P.Rajesh Kanna; T.Prasanna Kumar	Agriculture	Automated Rubber Tapping Machine	BE Student; B.E Student; Teaching; Teaching; B.E Student
24	GujAgriROD1708	Rodheliya Ajay Ashokbhai; Delvadiya Krunal Ghanshyambhai; Bhetariya Ravi Parbatbhai; Rangholiya Maulik Thakarshibhai;	Agriculture	Automated Agricultural Drip Tube Winding Mechanism	4 Students
25	KerAgriSeb1900	Sebine Francis; Lirin Philip; Tony J Pattara; Sebin Sebastian;	Agriculture	Design, Analysis and Fabrication of a Coconut Dehusking Machine	4 Students
26	HarAgriDak2415	Dakshim Chhabra; Aadil Nabi	Agriculture	E-Bijuka	2 Students
27	MahAgriAka3631	Akash Shegaonkar,Akshay Akulwar,Bhargav Chati, Akshay Shelke	Agriculture	Mobile Fruit Plucker	Student

28	GujBio PRA1869	Prachi Pandey	Bio Pharma	Novel Carrier Systems For Targeted Drug Delivery In The Treatment Of Arthritis	Academician
29	RajCommMan1814	Manoj Pipersania	Communications	Cloud Communication Service "BroYo i.e. Broadcast Yourself" to be Made Available on new website URL www.callengage.com	Self Employed
30	TamDigiAsw1896	Aswin Venu C	Digital Signal Processing	SeDAS –Scalp Electrode Data Acquisition System- A Single Channel Low Cost EEG Equipment	Student
31	DelEducNee1607	Neelesh Budhiraja	Education	MyExamPlan	Entrepreneur/ Entrepreneur
32	WesElecSUS2012	Susmita Mondal; Raka Ganguli; Saujit Saha; Soumyajit Chakraborty	Electronics and PCB	Portable Solar Powered USB Charger & Automatic Night Lamp	4 Students
33	TamEnerR.P2436	R.Prabu	Energy	Avoidance of the dust pollution in roadways due to heavy vehicles with information system	Teaching
34	MahFoodVED3060	Vednath Pundlik Kalbande	Food Technology	Design and fabrication of Lemon juice making machine	Asst. Professor
35	PonMateR.G2340	R .Gurunathan; K.senthil	Materials	Solar Power Automated Road Sweeper	Teacher; teacher
36	TamMateG.G3513	G.G.Sozhamannan	Materials	Synthesis and characterization of Hybrid Nano (Al /Nano TiCp/ Gr) composites: stir casting method	Associate. Professor
37	UttMobiSHA1880	Sharad Kumar Maheshwari	Mobile VAS	Iec Mock Test Mobile Application	Asst Professor
38	DelMobiFAI3651	Faisal Shah Khan	Mobility	Two Wheeler Cng Bike	Student
39	WesNanoRab2450	Rabindranath Jana	Nanotech	Development of Nanostructured Artificial Leaf for Hydrogen Generation from Water	Teaching
40	AssProdAru1783	Arun; Dr. S. Kanagaraj	Product and Services	Injection Mouldable Polymeric Composite Based Passive Polycentric Knee Joint	PhD Student; Associate Professor, Department of Mechanical Engineering, IIT Guwahati
41	TamProdANA1801	Anand; R.ajay; S.gowtham; N.dinesh Kumar	Product and Services	Semiautomated Multipurpose Scrubber	3 Students, Asst Prof.
42	TamProdMur2500	Murugan E	Product and Services	Smart Scope-X6 for Microbiological analysis and Bio-Medical Application	Student (Research Scholar))

43	DelProdPra3310	Prashant Goyal; Dr. Soniya Gupta; Amit Sinha	Product and Services	Home based Speech Therapy Products.	Co-founder & Product Developer@ Innoflaps Remedy Pvt. Ltd., 2 Speech Therapists
44	TamProdT.S3502	T.Sivaranjani	Product and Services	Mobile Phone based Transcutaneous Electrical Nerve Stimulation	Academician
45	UttProdShi3649	Shivam Srivastava; Saurav goswami; Yogesh Tiwari; Sankalp Dixit	Product and Services	Baby Care Taker	4 Students
46	MahWateVED3060	Vednath Pundlik Kalbande	Water	Dual Throw Hand Pump	Teaching- Asst Prof
47	MahWebkas1695	Kashif Tasneem Khan	Web	SaaSified Pathology Web Application - A SaaS Model	Student
48	MahElecAMA1980	Amarendra Ranade & Joel Wilson	Electronics and PCB	SmartStick- An Aiding Companion	2 Students
49	TamSocigan1856	Ganesh Subramanian; Dr.T.Jayanthy; Dr.M.P.Chitra	Social	A Novel Voice Recognition System for Speech Impaired People	Research Scholar; Professor; Professor
50	TamSociK.A3034	K.ananthanarayanan; Arunn T; Gowthama Raja E	Social	Sentiment Analysis Of Social Network Users	3 Students
51	KarEnerDr.3048	Dr.M.Eswaramoorthy	Energy	Design, Development and Experimental Evaluation of V trough Solar Collector with Thermal Energy Storage for Drying Applications	Professor and Head
52	KarMateDr 1359	Dr. Jandas P J	Materials	Reusable masking materials for metal protection in Aviation and Shipping Industry	Researcher
53	TamMon3098	Monesha G; Vannitha; Thilaga	Others	An Efficient Certificate Lees Encryption For Data Sharing	3 Students
54	AndWateSwe1630	Swetha Shenoy	Water	Smaat Community Water Center	Employed
55	HarAgriDr.3373	Dr. Nitin Saluja	Agriculture	Intelligence enabled smart sensors based E-weed control.	Research
56	TamCommsat3092	Sathish Kumar; Janani.as; Aarthi.T;	Communications	Scalable Wireless Ad-hoc Network Simulation Using Xtc	3 students
57	KarElecNav3646	Navajith Padmanabha Karkera	Electronics and PCB	Smart Electronic Helmet for Motorcycle	Student

58	TamHealS.M3500	S.Maheswari	Healthcare	Head Controlled Wheelchair movement and light switch control for quadriplegia patients.	Assistant Professor
59	GujMobiPri2630	Pritesh Ashokkumar Bhatia; Abhishek Jain	Mobility	Portable Food Kiosk	Entreprenuer; service
60	AndProdSan2072	Santosh; Viswanadh Malladi; Madhav Reddy	Product and Services	Design of motorcycle seat (add-on)to avoid back pain, butt pain and fatigue	Consultant
61	KarBio Ips2584	Ipseeta Jena; Gaurav P Bharadwaj; Srinivas B V	Bio Tech	Pharmaceutical Grade Omega-3 Fatty Acid Supplements for Nutraceutical Applications as a Major Product and Poultry Feed and Aqua Feed as a Byproduct from Waste Silkworm Pupa	Research Scientist; Research Fellow; Entrepreneur
62	PonEnerAru3485	Arunagiri; Anubam; Venkatesh	Energy	Solar Tracking System Using Solar As A Sensor	3 Students
63	KarHealKou3442	Koushik B; Akash G Parvatikar; Biswajit Roy	Healthcare	INDRABHUJA: Low cost Myoelectric Prosthetic Hand	3 Students
64	MahAnk2605	Ankit Sandesh Patil; Duryodhan Vitthal pendam	Others	System for Double sided incremental forming for rapid prototyping sheet metal	Student; Assistant Professor;
65	MadRefrPra2209	Pranav Mokshmar, Dr. Priyanka Mokshmar	Refrigeration	Hybrid Air Cooling System	Business
66	TamTextP. 3659	P. A. Sekar	Textiles	Power loom warping machine.	Researcher
67	TamAgriU.J1729	U.Jayanth Kumar; G.Karthick Regunath; S.Krishnan;	Agriculture	Low Cost Groundnut Harvester	3 Students
68	AndBio Shi2610	Shivani; Anuradha Pal; DV Padmavathi; Dr. Suman Kapur	Bio Tech	RIGHTBIOTIC: The Fastest Antibiotic Finder	Ph.D Scholar; Ph.D scholar; Ph.D Scholar; Mentor & Senior Professor
69	TamBio Dr.3336	Dr. R. Rajkumar	Bio Tech	Green Manufacturing of Pharmaceutical Drugs Using Smart Enzyme Libraries	Scientist, Biotech Start-up Founder
70	DelCommVis2664	Vishal Gupta	Communications	In the last few years, the Phone has become a whole lot Smarter but the Contacts on the Smartphone have not Evolved! We are Creating a Mobile Application that is the next generation of PhoneBooks. Diro (our brand name) will include the following: • One	Self-Employed
71	TamDigiRAJ3531	Rajeshwar R, Swarnalexmi N, Timple S	Digital Signal Processing	Infant Cry Analysis for Emotion Detection using Cross-Correlation Algorithm	Student
72	GujHealAbh2466	Abhinab Das	Healthcare	SOS India	Student

73	TamHealS. 2551	S. Krupakar Murali	Healthcare	Low Cost Medical Sterilization using Atmospheric Pressure Plasma	Business Persons
74	MahMicrVIN2707	Vinaykumar Patil; Anand Kashinath Joshi;	Micro Engineering	Thermal Analysis of Pre Heated Air Combustor for Melting Application using Green Energy Technology	Academicians
75	TamBio K.U3142	K.UMA	Bio Informatics	Traffic Prognosis and Analysis using Big Data and Visualisation	
76	MahChemDr.1371	Dr. Anant Balkrishna Marathe	Chemical	Technology for Value Addition to Green Leafy, Fruity, Juicy Vegetables and Fruit Waste from Farm	Academician

Annexure 2: The following 219 innovations were shortlisted, from a total of 749 innovations submitted, through an online evaluation by the jury. Due to the highly competitive nature of the projects and due to the limitations of this platform, a final 76 innovations could be invited to participate in the i3 National Fair.

S. No.	Name	Focus Area	Invention Title
1	Dr. Vandana Bharat Patravale	Healthcare	Targeted Nanocarriers for Parenteral Treatment of Malaria
2	Nishanth	Mobility	Self Stabilizing Wheel Chair
3	Bharatheeswaran.KTM	Electronics and PCB	Overload Safety AutomationIn two Wheelers
4	Kumari Shailendu, P.padmasri	Electronics and PCB	Computer-Vision Based Collision Avoidance for UAVs
5	Dr. Amol Diwakar Kadu	Product and Services	An Eyewear To Provide the Disfigured Eye Resemble Normal Eye in Appearance
6	Vignesh.N.S	Others	Design and Fabrication of Underwater Robot
7	S. Merish	Herbal	Trans-dermal Herbal Plaster for Fever
8	Bharati Sayankar	Electronics and PCB	Device-free Indoor Positioning System Using Visible Light Led
9	Rampradheep G S	Energy	Production of Electricity from Cement Matrix Cake In-Built with Poly - Ethylene Glycol (PEG)
10	Santhoshkumar K Srinath D	Social	Smart Assistant for Disabled Patients Using Emg

11	Chandan Singh	Electronics and PCB	Real Time Smart Accessory to Avoid Various Types of Roads Accident
12	Shafeekkur Rahman	Mobility	Anti Theft Wheel Locking System
13	Manivannan S	Others	Cable to Transfer Charge and Data Between Mobile Phones
14	Vivek Vyas	Social	India's 1st Tribute Portal Shradhanjali.com
15	Shamli B	Mobility	Android Application Based GSM Power Management and Conservation in Buildings
16	A.Sahaya Grinspan	Mobility	CLASSIK – Creation of Lift Axle Suspension System with Indian Know-how
17	Vaishali Tehre	Social	Design of Automized Inspection Vehicle for RTO
18	Libin Varghese	Electronics and PCB	Vidyuth Mithra: A Multi Purpose Solar Powered Protection Device from Electrocution
19	Nambiar Rohitkrishna Rajendran	Product and Services	Integrated Vitals Monitoring System with Pc-based Display and Data Logging.
20	T Suresh	Electronics and PCB	Smart G-Shoes
21	Karthikeyan.D.R, Bharathkumar.P, Yuvaraj.S	Electronics and PCB	Aadhar Card Voting
22	Suyash Kamal Soni	Materials	Advanced Pyrotechnical Missile Launcher
23	Dhashwanth Srinivas G	Agriculture	Automated Rubber Tapping Machine
24	Rodheliya Ajay Ashokbhai	Agriculture	Automated Agricultural Drip Tube Winding Mechanism
25	Sebine Francis	Agriculture	Design, Analysis and Fabrication of a Coconut Dehusking Machine
26	Dakshim Chhabra	Agriculture	E-Bijuka
27	Akash Shegaonkar,Akshay Akulwar,Bhargav Chati, Akshay Shelke	Agriculture	Mobile Fruit Plucker
28	Prachi Pandey	Bio Pharma	Novel Carrier Systems for Targeted Drug Delivery in the Treatment of Arthritis
29	Manoj Pipersania	Communications	Cloud Communication Service “BroYo i.e. Broadcast Yourself” to be made Available on New website URL www.callengage.com
30	Aswin Venu C	Digital Signal Processing	SeDAS –Scalp electrode Data Acquisition System- A single channel Low cost EEG Equipment
31	Neelesh Budhiraja	Education	My Exam Plan

32	Susmita Mondal	Electronics and PCB	Portable Solar Powered USB Charger & Automatic Night Lamp
33	R.Prabu	Energy	Avoidance of the Dust Pollution in Roadways Due to Heavy Vehicles with Information System
34	Vednath Pundlik Kalbande	Food Technology	Design and Fabrication of Lemon Juice Making Machine
35	R.Gurunathan	Materials	Solar Power Automated Road Sweeper
36	G.G.Sozhamannan	Materials	Synthesis and Characterization of Hybrid Nano (Al /Nano TiCp/ Gr) Composites: Stir Casting Method
37	Sharad Kumar Maheshwari	Mobile VAS	Iec Mock Test Mobile Application
38	Faisal Shah Khan	Mobility	Two Wheeler CNG Bike
39	Rabindranath Jana	Nanotech	Development of Nanostructured Artificial Leaf for Hydrogen Generation from Water
40	Arun	Product and Services	Injection Mouldable Polymeric Composite Based Passive Polycentric Knee Joint
41	Anand	Product and Services	Semiautomated Multipurpose Scrubber
42	Murugan E	Product and Services	Smart Scope-X6 for Microbiological Analysis and Bio-Medical Application
43	Prashant Goyal	Product and Services	Home Based Speech Therapy Products.
44	T.Sivaranjani	Product and Services	Mobile Phone Based Transcutaneous Electrical Nerve Stimulation
45	Shivam Srivastava	Product and Services	Baby Care Taker
46	Vednath Pundlik Kalbande	Water	Dual Throw Hand Pump
47	Kashif Tasneem Khan	Web	SaaSified Pathology Web Application - A SaaS Model
48	Amarendra Ranade & Joel Wilson	Electronics and PCB	SmartStick- An Aiding Companion
49	Ganesh Subramanian	Social	A Novel Voice Recognition System for Speech Impaired People
50	K.Ananthanarayanan	Social	Sentiment Analysis Of Social Network Users
51	Dr. M.Eswaramoorthy	Energy	Design, Development and Experimental Evaluation of V trough Solar Collector with Thermal Energy Storage for Drying Applications
52	Dr. Jandas P J	Materials	Reusable masking materials for metal protection in Aviation and Shipping Industry

53	Monesha G	Others	An Efficient Certificate Lees Encryption For Data Sharing
54	Swetha Shenoy	Water	Smaat Community Water Center
55	Dr. Nitin Saluja	Agriculture	Intelligence enabled smart sensors based E-weed control.
56	Sathish Kumar	Communications	Scalable Wireless Ad-hoc Network Simulation Using Xtc
57	Navajith Padmanabha Karkera	Electronics and PCB	Smart Electronic Helmet for Motorcycle
58	S.Maheswari	Healthcare	Head Controlled Wheelchair movement and light switch control for quadriplegia patients.
59	Pritesh Ashokkumar Bhatia	Mobility	Portable Food Kiosk
60	Santosh	Product and Services	Design of motorcycle seat (add-on)to avoid back pain, butt pain and fatigue
61	Ipseeta Jena	Bio Tech	Pharmaceutical Grade Omega-3 Fatty Acid Supplements for Nutraceutical Applications as a Major Product and Poultry Feed and Aqua Feed as a Byproduct from Waste Silkworm Pupa
62	Arunagiri	Energy	Solar Tracking System Using Solar As A Sensor
63	Koushik	Healthcare	Indrabhuja: Low Cost Myoelectric Prosthetic Hand
64	Ankit Sandesh Patil	Others	System for Double sided incremental forming for rapid prototyping sheet metal
65	Pranav Mokshmar	Refrigeration	Hybrid Air Cooling System
66	P. A. Sekar	Textiles	Power loom warping machine.
67	U.jayanth Kumar	Agriculture	Low Cost Groundnut Harvester
68	Shivani	Bio Tech	Rightbiotic: The Fastest Antibiotic Finder
69	Dr. R. Rajkumar	Bio Tech	Green Manufacturing of Pharmaceutical Drugs Using Smart Enzyme Libraries
70	Vishal Gupta	Communications	In the last few years, the phone has become a whole lot Smarter but the Contacts on the smartphone have not evolved! We are creating a mobile application that is the next generation of PhoneBooks. Diro (our brand name) will include the following: • One touch contact exchange with voice match
71	Rajeshwar R, Swarnalexmi N, Timple S	Digital Signal Processing	Infant Cry Analysis for Emotion Detection using Cross- Correlation Algorithm
72	Inder Kumar Mirchadnani	Electronics and PCB	Traffic Light Signal Break Detection System Through Mobile Phone
73	Aruna Dhanraj Tete	Electronics and PCB	Design and Implementation of Electro-Bracelet for Women Safety

74	Abhinab Das	Healthcare	SOS India
75	S. Krupakar Murali	Healthcare	Low Cost Medical Sterilization Using Atmospheric Pressure Plasma
76	Suman Kumar Jha	Materials	Natural Cooling Pad by Phase Change Materials
77	Ramalingeswara Rao K V	Mobile VAS	LanKeys (www.lankeys.blogspot.in)
78	Anbu Kaveeswarar Selvaraju	Mobile VAS	Abugida Keyboard
79	Shubham Takode	Mobility	GPS based Locking System
80	Devesh Upadhyay	Mobility	Hydrodynamic Application in Transmission System and Its Analysis in Manual Transmission Vehicles
81	Mr. P. Lakshmanan Pandian	Mobility	Hybrid Combustion In Two Stroke S.i Engine Using Hydrogen Gas As Alternate Fuel
82	Dr. Dhoolappa	Product and Services	Making Good Use of Animal and Plant Wastes: Development of Low cost, Novel & Eco-Friendly Scaffolds
83	Sowmya Narayanan	Product and Services	Nidra Yantra- Audio visual Entrainment & Acupressure Therapy for Insomnia
84	S. Krupakar Murali	Social	Universal Low Cost Waterless Urinal system (Poornam)
85	Kunal Vaid	Textiles	Solar Powered Tassar Silk Reeling, Spinning and Twisting Machine for rural users
86	Sukhada Prasad Bhingarkar	Web	Web Application Security Framework Against Economic Denial of Sustainability Attack (EDoS) in Cloud Environment
87	Sivakrishnan.J	Agriculture	Automated Irrigation Control and Monitoring
88	Raviprasath.T	Energy	Design of Oven Powered by Emitted Heat from Refrigerator
89	Aananth Roy R	Energy	Design and Fabrication of Heat Storage Thermoelectric Harvesting Devices
90	P.P Ashokan	Energy	Electricity Generation. Invention Of New Methods.
91	Sumit Murab	Product and Services	Injectable Silk-In-Silk Microsphere-Hydrogel System for Treatment of Lower Back Pain
92	Umesh Lokhande	Web	www.binaryupdates.com
93	Vijayan Thiru	Agriculture	Ecopot (ii) Garbage Gardens - Wastes To Food,o2, Health, Money&happiness
94	Priayarajan R	Agriculture	Low Cost Crop Monitoring System

95	Nilesh Parashram Awate	Agriculture	Design And Development of Garlic Peeler Machine
96	Manjurkha Mehbubkha Pathan	Electronics and PCB	Automatic Drilling Machine Using Pic Controller
97	K.Mohanraj	Electronics and PCB	E-sword – An Authenticated Self Protector for Women & Children
98	Kshitij Singh, Abhijeet Vishwakarma, Anand Pandey, Shubham Agrawal	Energy	Swaech This Innovation Is Titled "swaech" An Abbreviation for Smart Waste Attenuation
124	Sandeep Verma	Mobility	Railway Monitoring & Safety Control System
125	Rahul	Mobility	Foldable Motor Scooter
126	Soham Ganatra	Product and Services	Total Insulin Dose Calculator
127	Sivaraman.N	Product and Services	Safe and Secured Mechanical Gas Cylinder Drain Detector
128	Sivaraman.N	Product and Services	Protective and Thermal Resistant Shoe for Roadworkers
129	Aravinth.T	Product and Services	Remote Controlled Hydraulic Jack
130	Harinarayanan Sathyanarayanan	Product and Services	INTUCAM-45 Fundus Camera
131	Ferah T P	Product and Services	O T U T
132	Vineesh V S	Product and Services	CARE247: A Low-Cost, Iot based, Wireless Wellness Monitor for the Elderly
133	Meenakshi Sundar	Agriculture	Ground Nut Decorticator Machine Using Mechanical Elements
134	Kavin Prasath R	Electronics and PCB	Ultrasonic Obstacle Recognition System for Visually Impaired Persons
135	Shashwat Shukla	Electronics and PCB	Integrated Alarm Annunciation System with Dual Communication Capability and with Provision for Operator Assisted Messaging
136	Ranjeet Sadashiv Patil	Electronics and PCB	Real Time Monitoring Scheme For High Voltage Capacitor Bank
137	Asutosh Nayak	Energy	Portable Washing Machine
138	Dr.Kalyan Sasidhar	Energy	Light Weight Smart Building Infrastructure
139	Khushkumar Harshadbhai Patel	Materials	Movable Seat for Physically Disabled in Cars
140	Sivaranjini Balu	Others	Separable Reversible Data Hiding In Encrypted Image

141	Vidhya Ramanan.m	Digital Signal Processing	Implementing An Advanced System For Controlling The Handicap Vechicle
142	N.Manikandan	Electronics and PCB	Walking Stick For Blind People Using Ir Sensor
143	Pankajkumar Chhatrala	Healthcare	Selective leukapheresis: A device to Remove Cancer Cell From Blood In Blood Cancer Patient
144	Debadrita Mandal	Herbal	dPAINdend A Low Cost Herbal Remedy for Pain
145	Nandhakumar R	Materials	Earthquake Resistant Pile Foundation
146	Bahubali Babanrao Sangame	Others	Design and Development of Air Assists Universal Inspection Fixture on CNC-CMM for Optimization
147	Suryarajan	Product and Services	Design of Exoskeleton Model for Upper Limb Prosthesis
148	Gomathinayagam P	Communications	Performance Optimization of CODEC in VoIP Using Raspberry Pi
149	Sundeep Kumar Dhawan	Materials	Smart Self Healing Coatings of Conducting Polymers for Corrosion Protection of Iron in Marine Environment
150	Akash Ujawane	Mobility	Pushpak Viman – Solar Powered Bamboo Rickshaw and Its Variants
151	Deepan J	Product and Services	Continuous Ambulatory Monitoring of Patients in Coronary Care Unit
152	Vijayakumar.b	Web	Privacy-Preserving Multi-keyword Ranked Search Over Encrypted Cloud Data
153	Naren Mohan	Bio Pharma	Objective Measurement of Isoniazid (INH) levels for the Drug Adherence of TB
154	Vigneswaran S	Electronics and PCB	Modern Digital Eye Based Assisting Device for Visually Challenged Persons
155	Devesh upadhyay	Others	Hydrodynamic Application In Transmission System And Its Analysis In Manual Transmission Vehicles
156	Thiyagarajan	Agriculture	Automatic Cashew Nut Peeling Machine
157	Pulkit Sharma	Agriculture	It Is A Supplyment Which Prsent In Power Nd Capsule Form
158	Vijayalakshmi Ramanathan	Digital Signal Processing	ECG Assisted Blood Pressure Measurement
159	Vuppalapati Jahnavi	Electronics and PCB	A Spurious-Power Suppression Technique for A Low-Power and High-speed Multiplier
160	Thamaraikannan	Electronics and PCB	Real Time Image Based Motion Detection for Security Enhancement Using Raspberry Pi
161	Mohan Chavan	Energy	Automatic Tube Cleaning System to improve the Efficiency & Performance of Shell & Tube Heat Exchangers

162	Rm.arunachalam	Refrigeration	Eco-Friendly Human Robes For Maintaining Body Temperature
163	Dilshad Ahmad	Water	Tino Water Purifer: A Three In One Plug And Play Modular Water Purifier To Remove Microbial, Chemical (arsenic And Fluoride) And Physical (turbidity, Colour, Odour & Bad Taste) from Water. Made out of Locally Available Materials.
164	Jayati Lalwani	Agriculture	Hairitage
165	Suhas Vittala	Agriculture	Varaha-Local Composting Infrastructure for Home
166	Hari Prakash	Electronics and PCB	Voice and Self Intelligent Home Automation
167	Kaushik Mohanty	Electronics and PCB	BAJRA-The Self Defender
168	Kaushik Mohanty	Electronics and PCB	The Smart Bag
169	Bhagath Singh Karunakaran	Energy	E-Alerta
170	Anant Nevatia	Healthcare	Providing Primary Health Care At The Base of The Socio Economic Pyramid
171	Mahesh	Herbal	Shata-dhauta-patram- A Novel Bioreactor For Ayurvedic Formulation Of Ghee for Biomedicinal application
172	G.Prakash Kanna Ganesan	Mobility	Propeller Shaft Security Locking System In Four Wheelers
173	Sarathkumar A	Mobility	Passenger Bus Alert System for Easy Navigation of Blind
174	Abhishek Tiwari	Product and Services	Ineeddoctor.in - Live Tracker of Doctor Appointments
175	Dr.A.Karthikeyan, Mr.T.Santhosh Kumar	Social	Device For Rescuing Trapped Victims From Bore-wells
176	Renita Mary Florence	Agriculture	Optimization Of Water Usage And Seasonal Based Irrigation Using Wireless Networks
177	Dr. Anant Balkrishna Marathe	Chemical	Technology for Value Addition to Green Leafy, Fruity, Juicy Vegetables & Fruit Waste from Farm
178	Ramdas M U	Electronics and PCB	Comprehensive Protection from Electrocution - Life Helmet
179	Anwar Wali Gutti	Energy	Anti-Gyroscopic Bearings.
180	Vinaykumar Patil	Micro Engineering	Thermal Analysis of Pre Heated Air Combustor For Melting Application Using Green Energy Technology
181	Samaresh Deyashi	Others	Auto Work Force Tracking And Escalation System: For Fast, Efficient And Transparent Governance

182	Suman Kumar Jha	Refrigeration	Self Driven Refrigerators
183	Lilli Prasath J	Electronics and PCB	Iot Based Intelligent Lighting System With Daylight Harvesting For Smart Green Building
184	P.Raj Kumar, K.Aravind balaji, P.Vinoth Kumar	Agriculture	Design and Implementation of Autonomous Quadcopter
185	Mounesh Nandawadgi K	Agriculture	Design of Chemical Spraying Machine
186	K.Uma	Bio Informatics	Traffic Prognosis And Analysis Using Big Data And Visualisation
187	Sujijegaprasanthini	Electronics and PCB	Fire Fighting Robot Using Android Application Through Voice Command
188	Prit Gala	Electronics and PCB	Smart Helmet
189	Mohanish shah	Mobility	Design & Analysis of Punctured Assistant Apparatus(PAA)
190	A.Jegannathan	Mobility	Advanced Home Automation System(AHAS)
191	Pavan.R	Nanotech	Concentration of Gold Nanoparticles at Zero-cost
192	Rakesh S	Agriculture	The Telescopic Multipurpose Pruning Machine
193	Gyanendra Singh	Bio Tech	Surface Charge-Changing Modified Nano Lipid Carrier Bacterial Cell Wall-Targeted Delivery of Tuberculosis
194	Mohamed Azharudeen	Electronics and PCB	Web services Interface for Visually Impaired using Speech Recognition Sydtem
195	Brinda.J	Healthcare	Advanced Healthcare Management
196	Mr.J.Prasad	Healthcare	Android Based Biosignals Monitoring
197	Nilay Baran Pati	Mobility	Hexarotor Utility Aerial Vehicle
198	Shantnu Singh	Others	Automatic Waste Dumping Bot
199	Parthiv Yadav	Communications	MsgScroll
200	D.M.Arvind Mallik	Education	Mind Maps at Flipped Classroom
201	S.V.Muthu Priya,R.Mythili,K.Jaya Bharathi,R.Soundarya	Education	Pattern Unlock Using Digital Signature
202	Amitesh Ranjan	Education	Multipurpose Educational Robotic Kit

203	Varun Kumaran	Electronics and PCB	Alternative Transportation Modes & Improvisation of Existing Transport System
204	R.R.Vishnu Raajan	Electronics and PCB	Automatic Pneumatic Bumper
205	Amiya Kumar Samantaray	Electronics and PCB	AURASSURE - Air (Ambient Air Quality Monitoring and Weather Station)
206	Subhashini.r	Electronics and PCB	Single Remote Controller for Different Voltage Ranges.
207	Aaquib Faridi	Electronics and PCB	High Current Motor Driver
208	Bhavsar Foram Dipakkumar	Electronics and PCB	Password Based Door Locking System Using Microcontroller 89c51
209	Uday Mujumdar	Energy	'sour-mitra'an Innovative Tool To Ensure Performance and Efficiency of Rooftop Photovoltaic System
210	D.Mahalakshmi	Healthcare	Bigdawg Poly Store System
211	Philip Harrison.A	Healthcare	Medical Reference System
212	Thomas M.Walter	Herbal	Non-Invasive Herbal Medicine For Breast Cancer
213	Bharath Krishna	Materials	Modern Sanitary System
214	C.Muthu,P.Arunkumar,M.Karupusamy	Mobility	Dual Power Hacksaw
215	Prem Surana	Others	Multi Stator Multi Rotor Permanent Magnet Induction Motor And Generator
216	N.Vanmathi,B.Thanuja	Social	E-Voting using IOT
217	Sebastian Vindro Jude.p	Social	DIAT: A Scalable Distributed Architecture for IoT
218	Bimal Sarangi	Water	Conversion Of Sea Water In To Pure Drinking Water Through Plantation & Mechanical processing
219	Mohamed Nowfal	Web	Build Smart Homes For Smarter Cities: A Way To Digitize India

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 around 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.

In its 120th year of service to the nation, the CII theme of Build India - Invest in Development: A Shared Responsibility, reiterates Industry's role and responsibility as a partner in national development. The focus is on four key enablers: Facilitating Growth and Competitiveness, Promoting Infrastructure Investments, Developing Human Capital, and Encouraging Social Development.

With 66 offices, including 9 Centres of Excellence, in India, and 8 overseas offices in Australia, Bahrain, China, Egypt, France, Singapore, UK, and USA, as well as institutional partnerships with 312 counterpart organizations in 106 countries, CII serves as a reference point for Indian industry and the international business community.

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