

Game Changing Indian Innovation Landscape

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Many people think - India doesn't produce any innovations" - they are dead wrong. Why? Here is why. Ingenuity of Indian Innovation Landscape is attributed to one thing - the imagination of Indian mind to extract the maximum with minimal investment. And, in Indian context, the definition of Innovation is - "How novelty is created, and value is added".



To understand, India's Innovation System you need to look at different levels of Innovation systems in India. The five different levels of innovations are - grassroots innovations, individual innovations, institutional innovations, industrial innovations and investment innovations. If grassroots innovations are at the bottom of the pyramid then industrial innovations and investment driven innovations are at the top of value chain.

On the top the innovation value chain are Multi-national companies (MNC's), Corporates, Institutional investors investing into R&D. The fact that there are over 750 R&D global centers established by almost all the leading MNCs spanning across all Industry verticals - Power,

Lighting, Solar, Transportation, Automobile, Pharmaceuticals and Aerospace etc. is a testimony to the creative and well educated scientific, technology talent pool available in the country.

General Electric, Microsoft, Siemens, IBM, Microsoft are some of the major global players. GE has its global innovation center that supports innovations across Manufacturing, IT, Healthcare, Life Sciences and Diagnostics sectors. Siemens is engaged in the fields of Energy Management, Lighting, mobility and building technologies. DuPont India Innovation Center is focused on Sustainability, Safety and Automotive components. Not far behind is the leading Indian IT company, Infosys has earmarked 250 million USD funds for innovations. The commitment and seriousness cannot be exemplified.

On a different note, India's Mars Mission is another shining example of Indian ingenuity. Not only it was the lowest cost Mars Mission in space history, it was a first on many counts. The Indian Mars Mission used gravity to get away from gravity; Earth's gravity to slingshot into space and Sun to get there; and then Mars gravity to get closer. The entire program was all Indigenous and demonstrates the competency and mastery in "constraints based innovation". US, recently recognized ISRO for their unique feat. Yeah! Peer recognition means a lot for the Scientists who toiled and made the mission a success.

Now, looking at the other end of the spectrum, the reality is even more astounding. India is Frugal Innovations Leader. Frugal innovation, in general turns the constraints of limited resources into a competitive advantage, and is a distinctive specialism of the Indian Innovation system. Rural India is hot bed of innovations. Grassroots innovations come from the bottom of the pyramid and have powerful connotations. According to a published report, there are as many as 175,000 innovations and 600 patents filed for grassroots innovations. This should give you a perspective of the creative genius of the common man. The grassroots innovations reflect one thing – the can-do spirit, willingness to take up a problem, solve it creatively and change lives. It is important to highlight the fact that although most of the inventors are less educated, they have open mind, a key success factor.

Dr. Anil Gupta, Professor at IIM Ahmedabad is Father of Frugal Innovation in India. Over the last twenty seven years, Dr. Gupta is focused in bringing the frugal innovations to mainstream and globalize them. A walking scientist by nature, he interacts with grassroots inventors, scouts for people with knowledge, poor in money and then lets the great story unfold. Anil Gupta helped some of the innovators to make sales across all the continents, of course, let's set the expectation – he is not getting any financial returns, but only satisfaction. Few more such people can make even bigger difference, bringing grassroots innovations faster to mainstream.

Struck by their creativity and innovativeness Anil Gupta started Honey Bee Network, to discover, share and promote grassroots innovations that could benefit innovators and public. Not only that, Gupta goes one step further, and proposed what he calls a "G-to-G", that is, Grassroots-to-global model. Although, the reality is that there is a whole lot that needs to be done, the intentions of providing an international forum are genuine and over the long run are achievable. Others can join and lend a helping hand to accelerate further.

Another challenge in India that needs to be dealt with not only at grassroots level but across the board is "mind set". For example, it is so difficult to make the innovators to look outside their area of functioning. Their aim of innovation, is not to earn money but to change lives. Although this is a virtue, derived from cultural roots, and not necessarily construed as sign of weakness, one needs to evaluate financial returns for doing a global adventure, given that someone is backing the initiative, venture financially and expects a reasonable return.

It is very interesting to note that entities such as Grassroots Innovations Augmentation Network – GIAN and National Innovation Foundation (NIF), are facilitating the commercialization of grassroots innovations. Here is an example as to what they are going. The grassroots innovator - Rai Singh Dahiya never had a formal education and does not speak English. However, this innovator has closed business deals in Europe and Africa for his major innovation – a biomass-based gasifier and engine. This could not have been achieved but for the fact that entities such as GIAN, NIF etc. that are connecting the innovators with the mainstream and are scripting the success stories of India's grassroots innovators. They are attracting global demand for their innovations and creating impact. It is equally important to remember that Jugaad, frugal innovation is ideally a pre-cursor for systemic innovation. So, it holds enormous potential.

Frugal Innovations:

There are several remarkable success stories and problem solving innovations at grassroots level in India. What is a true hallmark of all these success stories is the fact that the inventors had very little education. Yet, they demonstrated the talent to solve the problems in a practical way – using tools on hand, extending their creative minds in mitigating the issues on hand and improvising on the other and moving on to accomplish what they set for. It is not the money that draws their attention to solve such problems, but to change lives. This is key driving factor of frugal innovations in India. How to do more with less, or to maximize the usage of particular goods or thing, is essentially a cultural outlook & inheritance, and part of Indian DNA. It is important to distinguish that - Frugal is not cheap; it means, design is great and is affordable. Here are few examples of successful innovations and innovators:

Mitticool fridge - Designed by Mansukh Bhai Prajapati, the Mitticool fridge is made of clay and requires zero electricity. It can keep food fresh for up to 5-6 days!. The clay refrigerator transformed the imagination of the world. The person who lost everything in Gujarat earthquake, designed Eco-friendly refrigerator that didn't need any power - has exported his invention to 7 countries. A truly remarkable success story.

Venus portable washing machine - Costs Rs. 1,500 and this portable washing machine can wash 4 to 5 clothes in a bucket.

The US\$ 50 Aakash tablet, for instance, won widespread acclaim as the cheapest tablet globally. It was intended to connect 2.2 million students from 25,000 colleges and 400 universities. But, it has now gone global.

Tata Swach - is a low cost water purifier targeted at rural families. It operates without requiring electricity or running water. Priced at \$20, it is 50% cheaper than its nearest competitor. It

combines one of India's most common waste products - rice husk ash, with coating of silver nanoparticles to filter water. In this way cutting edge science is helping create social and economic value from waste, reflecting the prowess of common Indian to take on the problems head on.

Wheel chair convertible to crutches - This 2-in-1 product works as wheel chair and when walking convert it to crutches and move on. This has potential of not just Indian market

GE's portable ECG, available at fraction of cost and runs on Mobile phone as app, has been a tremendous success in providing Healthcare access to thousands of Indians in rural areas. Such empowerment is the critical need of the hour. Rising to occasion is not only a moral high ground. It demonstrates the creativity, capability and dynamism to take on the problem head-on and provide actionable solutions.

Mohammad Hussain and his brother Mushtaq invented low-cost windmills and made a difference in the North East. GIAN took his invention to the salt pads of Gujarat and provided the locals with low cost alternative. As there was no diesel power involved or electric pumps needed, it saved lot of money for small farmers. Such, grassroots innovations are the core strength of India. And, as Dr. Anil Gupta put it - "one need not be educated - having creativity and trust within, is what is needed". This statement reflects the reality on the ground.

How High Schoolers are changing Indian Innovations Landscape:

In-line with Problem solving innovation, the High Schoolers are not behind. A truly remarkable aspect of Indian Innovation landscape is the active participation of High Schoolers and their genuine contribution to innovations space. Here are few examples - Gautham Praveen, of Grade 11, from Tirunelveli, invented CFL bulb remover. Remember often it is a challenge to get to ceiling to replace. Now, you can do it standing on the floor and using this handy tool. Likewise, a "wheel chair convertible to crutches was invented by Ramakishore and Sanjay from Chennai. Other cool inventions from high school students include - "Oxygen /carbon dioxide level indicators in car", "Low Cost Braille Printer" etc. The genius of extending the life of dot matrix printer, by retooling it with few value additions as Braille printer for the blind, shows the creative talent of young minds.

Now, on a different note, here is an example of process based innovation. India Postal department which has the largest postal network in the world with 460,000 employees and 155,000 post offices. 90% of these offices are located in rural India. Reinventing itself, the Postal department, in collaboration with e-commerce firms like Snapdeal and ShopClues is delivering packages to shoppers in the remotest corners and is targeting about \$1 billion in revenues, in the next two years. It started training its staff to handle tasks such as card payments and handling same-day shipments and opening fulfillment centers.

Amongst the truly committed enthusiasts of Indian Innovations are Dr. Anil Gupta, Dr. Nirmalya Kumar, Dr Yatish Bhupendra Vasudeo and others. Dr. Nirmalya Kumar, Professor at London School of Economics, and a great Indian Innovations supporter, in his book - "Marketing as Strategy: Understanding the CEO's Agenda for Driving Growth and Innovation" covers several attributing factors, and unique aspects of India's innovation landscape, especially in the

Multinational companies. Also, the book "Innovations from India: Harbingers of change" is good read for folks to know details on grassroots innovations of India.

In the Investment based innovations, Tata Capital, India Innovation Fund etc. are in the play. Tata Capital focuses on technology led innovations and typically invests 3 to 8 million USD in the technologies. Vortex, funded by Tata Capital manufactures highly efficient ATMs at competitive prices and has largest base of solar powered ATMs in the world.

Innovation Scholars in-Residence program is a unique program in India, run under the auspices of the President of India encouraging the creative and innovative potential of the people and linking them to technology institutions as well as provided mentor support. Also, the Department of Science and Technology (DST), in collaboration with Lockheed Martin Corporation of USA, is funding India Innovation Growth Program and providing guidance for technology commercialization and global market access. The Govt. of India sponsored India Inclusive Innovation Fund has set aside Rs. 500 Crores to fund various innovations. Yet another fund for nurturing innovations is India Innovation Fund (IIF). Funded at Rs. 100 crores level and lead by Industry leaders, offers financial assistance for innovations led growth.

It is evident from the above facts that Indian Innovation space is unique, vibrant and is multi-faceted. That said, there is still enormous potential to tap. And of course, there is certainly a need for institutionalization of grassroots innovations in India. This will accelerate, foster innovations further. In the time ahead, it is critical to harness all the talent and purpose it for betterment of core infrastructure and making lives better.

At the end of the day, it doesn't matter where the innovations come from – be it grassroots or from R&D lab of MNC's. What the market wants is competitive products and it does not care whether the product is coming from a high-end place or from the grassroots. All it should do is solve their problem or provide value add. That's what matters!.

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