

The Role of Department of Science & Technology in Fostering Innovations, Entrepreneurship & Incubation – A study

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Abstract: The startup Ecosystem continues to grow on a worldwide scale, and 2017 has no interruption, in fact, an extra push forward. Startups thriving all over the world, every year it becomes more apparent that Silicon Valley is no longer the only startup hub around. Since 2010, the Indian startup landscape has seen a prodigious growth towards the creation of innovative startups and this country, a home to a new breed of young startups has clearly evolved to become the third largest base of startups in the world. In the years to come, India is well expected to continue growing as a startup incubator, driven by factors such as massive infused capital, acquisitions and consolidations, increasing smart technologies, and an ever-growing domestic market. The India-centric innovations have worked together in making the world fostering with Innovations.

Keywords: Start-up Eco-system- Start-up Incubator Etc.,

Introduction:

A cordial relationships is existed between Innovation, Entrepreneurship and the economic development of a nation as established through various International studies. Innovation drives global competitiveness and the country which provides the impetus to knowledge and Innovation reaps its rewards. One of the differentiating factors between various developed and developing economies is the level of academic Entrepreneurship is the national Innovation system. The fact is, in the most of the countries, the development of the national Innovation system has been policy driven to focus not only on R&D, but also fostering mechanism for the Science-Innovation-Industry interface, skills and innovation potential of Human capital, Technology transfer and commercialization, efficient and transparent regulatory systems, enforcement of Intellectual policy protection, understanding of market dynamics, open trade and Investment in a stable Environment. In a developing economy like India, the Innovation Eco-system is still evolving through the country over the years has emerged as a large publicly funded R&D Infrastructure. Realizing that innovation is the Engine for national and global growth, employment, competitiveness and sharing of the opportunities in the 21 st centuries, the Government of India had embarked on the some of the key national building initiatives. The Government along with other key stakeholders are making serious and sincere efforts to create a sustainable yet progressive environment for the Innovation based Entrepreneurship to emerge and flourish through variety of new initiatives and partnerships. Therefore, efforts are already underway by creating new opportunities, New mechanisms and Instruments an enabling environment and Eco-system for entrepreneurs and start-ups to be a change agent and sustained economic growth.

START-UPS:

Under start-ups India, DST is playing a critical and pioneering role in building up the Institutional framework of Innovation eco-system. The National Science & Technology Entrepreneurships Development Board is the nodal body the aegis of department of science & Technology to help promote technology based entrepreneurship and also facilitate nurturing of knowledge- driven and Technology intensive start-up companies. The Department is also set up an autonomous body as its financing and to provide financial assistance through soft loans and equity to Indian companies and technology start-ups to commercialize indigenous technologies and also of foreign Technologies. DST has also partnered with Department of Higher education, MHRD to establish Research Parks and start-up companies.

ABOUT DST:

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 organizing, coordinating and promoting S&T activities in the country. The Department has major responsibilities for specific projects and programmes as listed below:

1. Formulation of policies relating to Science and Technology.
2. Matters relating to the Scientific Advisory Committee of the Cabinet (SACC).
3. Promotion of new areas of Science and Technology with special emphasis on emerging areas.

4. Research and Development through its research institutions or laboratories for development of indigenous technologies concerning bio-fuel production, processing, standardization and applications, in co-ordination with the concerned Ministry or Department;
5. Research and Development activities to promote utilization of by-products to development value added chemical Industries.

Green Revolution:

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

DEGITAL INDIA.

'Digital India is all about empowering people and enabling industries bringing relevant skill set for India. 5G, leading to better connectivity, would be a strong part when comes to Digital India.'

India would play an important role in developing global 5G technology standards with the New Technology poised to become robust Development. Digital India initially is very crucial Development of the Department of Technology & sciences. As the 5 G standards processes have started Globally, India would be one of the important players in formulating standards for it. To evaluate the 5G Forum constituted by the Prime Minister Sri Narendra Modi, NDA Government to evaluate and prepare a road map to adopt the newer Technology with the Global timeline of 2020 and position of India as a globally synchronized participant in the design Development of 5G based Technical Application.

Incubation Centers:

More than 100 Incubation centers in academic and R&D Institutions of repute has been established. These Institutions include IITs, IIM,s NITs, and others. Each of these incubators is either focused on a technology domain and combined together house more than 2000 start-ups. These incubators offer a total incubation space of approx. 700 thousands sq.feet. Many successful and high growth stories have emerged out of these incubators. DST has for the first time initiated a hardware systems incubation program plug in partnership with Intel and implemented by society for Innovation and Entrepreneurship (SINE),IIT Bombay. Intel is also a partner of DST in steering socially relevant and the market ready solutions through innovate for Digital India program now running in its second version, through the latest incubator in the country t-hub, Hyderabad.

The Business Incubator: Business incubators do not serve any and all the companies. Acceptance criteria vary from program to program, but in general only those with feasible business ideas and workable plan are admitted. It is this factor that makes it difficult to compare the success rates of incubated companies against general business survival statistics. Although most incubators offer their clients office space and shared administrative services, the heart of a true business incubation program are the services it provides to start-up companies.

Goals and sponsors: Business incubation has been identified as a means of meeting a variety of economic and socio economic policy needs which may include job creation, fostering a community entrepreneurial climate, technological commercialization, diversifying local economies, building or accelerating growth of local Industry clusters, business creation and retention, encouraging women or minority entrepreneurship, identifying potential spin-in or spin-out business opportunities or community revitalization.

A Sound Business concept: To set up Incubation centre that would give opportunity to the students of different disciplines which could be sanction money after looking in to the project merits? To build an Environment that will facilitate the creation of social enterprise knowledge through research and empower the students to apply for Entrepreneurships abilities to develop solutions for greater social impact through academia Entrepreneurship in India is on the verge of explosive growth. This also throws new opportunities for the Eco-system to take the shape through the Incubator- the place where the starts-ups are born.

Start-up Proceedings: To promote Innovation and Entrepreneurship it is pedestal to help knowledge driven enterprises to establish and prosper under organized science guidance. It also facilitates swift commercialization of a product based on sophisticated technology. The main objective of the incubation center is to produce successful firms that will leave the program financially viable and free standing. These incubators create jobs for graduates in Engineering & technology to commercialize the new products and strengthen the start-ups.

Understanding of your markets: At present the central and state governments are giving most priority for start-ups. In Andhra Pradesh due to lack of Industries the Unemployment is prevailed a lot. To substantiate this, Industrial is given major imp actable area, that filled with start-ups. The Pace can create a collaborative environment between Industry and academia through joint research projects and consulting assignments.

A Healthy Growing and stable Industry: The pace management believes that the research is the backbone for the holistic growth of the Institution and encourages the students and faculty to get them involved in research with innovative Ideas shall be transferred. A team of dedicated mentors and is dedicated to understand the client requirement and prepare a detailed Project report of the project (DPR) and provide advices with remarks along with Market Research Report for the commercial viability of the outcome of the project. All these services are provided to the incubate at nominal charges and college society is having a reserve fund to encourage the students of the College to be self employed.

Capable Management: We go further build the confidence of students and develop a better understanding of the working of the Industry, the Institute also arranges visits of the students to various Industries for more practical training and acquiring first hand information of the current Industrial needs.

ENTREPRENUERSHIP DEVELOPMENT PROGRAMS:

To bring awareness about the Entrepreneurship skills a 15 days Training program was organized for students at free of cost by providing accommodation for Non- Residential students. The Entrepreneurship skill training workshop was a Practical and intensive program which trained the participants on a process for developing and scaling of ideas. The program consisted of Identification of Business opportunities criteria's of selection and sources of information, Business opportunity guidance from industrial experts an

TECHNOLOGICAL ENTREPRENEURSHIP IN INDIA:

Technological Entrepreneurship in India has developed through several pathways, shaped by Government policy, the Education system, and through interaction with multinationals. In India, to promote TE, many Government and non-Government agencies a reputed efforts to enhance the TE activity. Particularly Department of Science and Technology (DST), Government of India has played a key role. Technology Innovation Management and Entrepreneurship Information Service (TIME IS), a joint project of National Science and Entrepreneurship Development Board (NSTEDB), DST and Federation of Indian Chambers and Commerce and Industry (FICCI) is now one of the credible ladder towards the enhancement of India's entrepreneurial economy. The project has taken initiatives to provide guidance and assistance to the entrepreneurs especially the technopreneurs to find technologies, projects, funding options and information about policy environment, incentive schemes and industrial infrastructure available in the country covering both the central and state government and have become proficient at tapping the local talent pool. Fourteen Science and Technology Entrepreneurship Park (STEP) and Technology Business Incubators (TBI) have been established which are acting as a real booster to convert Technology Innovations in to Techno – Entrepreneurship colleges and universities in India have established education and training programmes to foster entrepreneurship, Centre's for entrepreneurial studies and business incubators, like Society for Innovation & Entrepreneurship (SINE) at the Indian Institute of Technology Bombay, in Mumbai .Ministry of Science & Technology, Government of India launched a novel programme known as Technopreneurs Promotion Programme (TePP) to support individual innovators to become technology-based entrepreneurs (technopreneurs).The Home Grown Technology Programme (HGTP), was started in 1993 to support commercialization of technologies developed by indigenous research and development and provides soft loan (generally not exceeding 50% of the project cost) for technology development which is repayable in user friendly installments after the completion of the project support (formal and informal)from others. Formal support comes in the form of financial, technology, and strategic partnerships (Carrier et. al. 2004, Makhbul 2011). Informal support may come from personal and community-based networks (Makhbul 2011).Pathaket al. (2013) showed that individual attribute, intellectual property rights, entrepreneurial behavior, foreign investment, and technological adoption effect on technopreneurship development. Kamarudinand Sajilan (2013) found factors like limited access to financial resources.

The Role of DST- Indian Context.

The roots of India's current economic systems extend back to the time of colonial rule and its autocratic and fragmented structure. The country was made to forcefully serve as a market to its colonial bosses and their industrial products. Independence in 1947 brought many changes, but the country did not have to start "from scratch". The foundations of the today's legal, financial, educational, bureaucratic governance systems were inherited from the colonial period. Even the roots of publicly funded research structures, which have grown large today, date back to the colonial days. However, one key area of change following independence involved the adoption of a closed economy that relied heavily on central planning, restricted imports, and nationalization of industries. Not until 1991 did India open its economy, which led to real competitiveness and a need for innovation in all industries.

Indian Employment status:

India today is a vast democratic country with a population of over 1.2 billion people with diverse ethnicities, religions, and languages. Nearly 70% of Indians live in rural areas (Census of India, 2011), and over past 20 to 30 years there has been a continuous flow of people from villages towards cities, mainly in search of work (Vinayakam & Sekar, 2013). The Indian economy is mostly based on agriculture, which depends on the unpredictable South-West monsoon. Given the large population, it is a considerable task for the government ensures adequate and affordable supplies of food, drinking water, clothing, housing, education, and healthcare.

The people of India, especially the young, crave employment. There is a limitation to employment opportunities offered by the various sectors of economy, but the government does provide employment guarantee programs. However, these programs are targeted at providing basic needs and tend to provide labor-intensive jobs that have no link with innovation. There is a realization that, "to sustain rapid growth and alleviate poverty, India needs to aggressively harness its innovative potential, relying on innovation-led, rapid, and inclusive growth to achieve economic and social transformation" (Dutz, 2007). The innovative potential of the young Indian population, if supported through an effective innovation ecosystem, holds potential for developing entrepreneurship and providing the growth and job opportunities that India needs.

India's national innovation system

The current national innovation system in India is a vast and complex system comprised of knowledge producers such as science and technology institutions, academia, and innovating individuals and knowledge users (e.g., industry-production/services in the public and private sectors). Various governments in India have given priority to science, technology, and innovation, and therefore India has evolved a large publicly funded R&D structure. There are various councils and research structures under various ministries, which cater to different research areas and which are distributed around the country. Council of Scientific and Industrial Research (CSIR): established in 1941; 39 laboratories

- Indian Council of Agricultural Research (ICAR): established in 1929; 99 institutes and 17 research centres
- Indian Council of Medical Research (ICMR): established in 1911; 30 laboratories
- Defence Research & Development Organization (DRDO): established in 1958; 48 laboratories

There are many other publicly funded institutions that perform research and technology development for industries related to steel, oil and natural gas, renewable energy, coal, textiles, railways, road transport, electronics and communication, environment and forests, irrigation, and so on. There are also more than 1200 privately or state-funded Scientific and Industrial Research Organizations (SIROs).

Indian Innovation Eco-system: An innovation ecosystem is a combination of two distinct but largely separated economies: i) the knowledge economy (comprised of knowledge producers), which is driven by fundamental research, and ii) the commercial economy (comprised of knowledge users), which is driven by the marketplace (Jackson, 2013). In India, the innovation ecosystem includes the entire national innovation system described in the previous section, plus individual innovators and entrepreneurs; mentors; government policies; angel, venture capital, institutional, and industrial funding mechanisms, intellectual property rights mechanisms; technology transfer mechanisms; market inputs; and incentives, awards, and other innovation-recognition mechanisms, among others. Ideally, these various structures and mechanisms facilitate the smooth translation of innovations through the various segments of a complex innovation chain that takes ideas from "mind to market".

Conclusion Remarks:

Some of the key recommendations arising from the above are as follows: 1. Human resource crunch at the level of faculty/researchers that we are currently facing needs to be remedied on a war footing. For this purpose create comprehensive research programmes and facilities in better performing universities and institutions.

1. Creation Innovations Eco-systems around our Universities with the involvement of Industries and Research Institutions. Creative incentives for this purpose for both Industry as well as Universities. Encourage Institutions with complementary focus to be collocated.
2. Encourage Research by Quality Institutions in private sector on an equal footing.
3. S&T Project formulations should have clarity on goals and deliverables and flexibility in terms of implementation Details.
4. Organizations for S&T should be peer driven and free from Micro-management from above. Performance Assessment should be consistent with value system necessary for meeting Organization goals.
5. Create Administrative and finance systems in R&D Institutions to be a part of the delivery Team and not just be control Mode.

References:

1. Planning Commission Document faster, sustainable and more inclusive growth, -An Approach to 12th Five year Plan- Table-1, Page 19.