

## Tech start-ups and their ecosystems in India

Of late, technology entrepreneurship-led start-ups are emerging rapidly all across the globe, including emerging economies like India. Of course, they originated and are predominantly confined to the US followed by Israel even today. These tech start-ups, when they succeed, get scaled up in a short span of time, and in the process contribute significantly to the national economy in terms of technology-intensive new products/services, employment, income and exports, among others. Therefore, they have been identified with a great potential to enable an economy to transform its structure and achieve an accelerated growth through industrial rejuvenation aided by disruptive technologies.

However, there is a flip side as well. These start-ups are new ventures without any precedence or previous history of operations. (In this context, it is to be noted that start-ups do not include existing enterprises which are acquired by new management or inherited by younger generations from the older ones, and they do not include 'spin-offs' where a large firm has a control, directly or remotely. They do not include franchises of any form.) Such new ventures suffer from the liability of newness derived from the fact that they are unfamiliar and without precedent. Such start-ups have been observed to face diverse challenges on multiple fronts. Launching a start-up involves a considerable degree of uncertainty regarding its future. More often, start-ups are developed on a small scale with limited resources. They often face large and experienced competitors, powerful suppliers, sceptic customers and scarce resources. Therefore, their ability to withstand sustained losses is usually limited, and as empirical evidence indicates, most start-ups have a limited survival rate.

Start-ups face challenges not only prior to, but also after their emergence, or after achieving a certain degree of stability, or even after gaining initial stage of success. The crucial determinants of start-up emergence, stability and success are of two kinds: (i) firm-level resources (largely driven by its founders) which are internal to a start-up or a prospective start-up, and (ii) entrepreneurial ecosystem in which a start-up emerges or aspires to emerge. Given the strength/quality of internal resources, every start-up or prospective start-up tends to depend on the local environment for supplementing its own

resources needed to initiate or sustain or scale up its operations. Thus, apart from its internal resources, it is the local environment defined in the form of an entrepreneurial ecosystem, which would largely determine the success/failure of a start-up or a prospective start-up to emerge or sustain or grow, over a period of time. A strong and vibrant entrepreneurial ecosystem is found to have a positive impact on start-up fertility, stability and growth.

An entrepreneurial ecosystem for tech start-ups is considered unique, and is defined as a structure comprising a nucleus with a triple helix base and two outer layers. The nucleus consists of existing start-ups, and prospective start-ups, including sources of tech entrepreneurship, and the triple helix base comprises Government (both national and regional), industry (both public sector enterprises and private sector enterprises, including MNCs), and academic/research institutions (both Government-promoted and private-owned). The first outer layer comprises five indispensable components, namely (i) finance, (ii) human resources, (iii) market, (iv) support system (consisting of technology business incubators (TBIs), accelerators and co-working spaces, and other hard and soft support service providers), and (v) business and technology mentors, whereas the second outer layer consists of three supplementary components, i.e. conducive culture, supportive media and weather. A constant interaction between the nucleus and the various (indispensable and supplementary) components as well as the triple helix is the hallmark of such an entrepreneurial ecosystem of tech start-ups.

The entrepreneurial ecosystem is led by and driven towards tech start-ups and prospective tech start-ups, which therefore form the nucleus of the ecosystem. The triple helix forms the base or foundation of an ecosystem; it assumes significance as it directly provides or indirectly influences virtually every indispensable component of the first layer and influences every supplementary component of the second layer. The components constituting the first outer layer are indispensable because without their presence in adequate number as well as quality, an ecosystem may not emerge; even if it emerges, it may not survive, and even if it survives, it may not be effective. The second outer layer consisting of culture, media and weather is supplementary because an ecosystem can

emerge and function even without the presence of any or all of them. Rather, they have been observed to emerge and evolve along with the growth of entrepreneurial ecosystems. However, together they lend vibrancy to an ecosystem.

An entrepreneurial ecosystem is anticipated to undergo four different but sequential stages of evolution, namely (i) nascent, (ii) evolving, (iii) mature and (iv) self-sustainable. While Silicon Valley in the USA and Israel are considered to have crossed the stage of maturity and reached the stage of self-sustainability, other leading tech start-up ecosystems across the global economy are identified at one or the other of the three preceding stages of evolution. Among the emerging economies, India has been recognized as one of the potential sources of tech start-ups in the global economy, and within India, Bengaluru is considered to have one of the best ecosystems for tech start-ups in the world. However, this city, India's best grown ecosystem, is still undergoing evolution, and thus, has not reached the stage of maturity, leave alone self-sustainability. As of now, Bengaluru is experiencing a growing emergence of tech start-ups; many of them are able to survive and sustain, but hardly a few manage to scale up and grow.

The prevailing entrepreneurial ecosystems (National Capital Region – Delhi, Mumbai, Hyderabad, Pune and Chennai, apart from Bengaluru, are the leading ones) in India primarily support only the emergence, survival and sustenance of tech start-ups at present. But, an accelerated growth of tech start-ups through either attracting large-scale investments of private equity and investment funds or 'going public' has not yet emerged in a big way. Relatively underdeveloped market base and inadequate presence of effective business/technology mentorship are considered to be two of the most important responsible factors. As a result, tech start-ups in the form of 'cockroaches' (a start-up which keeps struggling and going forward in spite of changing environments) survive and operate, but scaling up to become a 'unicorn' (a start-up valued at over US\$ 1 billion) is an exception than a rule. This is substantiated by the fact that, as of now, India accounts for only 11 unicorns out of more than 4000 tech start-ups operating in the country, as against a global total of 167 unicorns. Out of the 11 India-based unicorns, 5 are operating out of Bengaluru. Further, unlike in the US and China, none of the unicorns went public or got acquired (excluding that of Bengaluru-based Flipkart by Walmart) from India so far. To that extent, tech start-up ecosystems in India, are still in the process of evolving.

However, India holds promise for the future. The triple helices – Government, industry and academia – are steadily and progressively focusing on the promotion of tech start-ups. The Government of India (GoI) has come out with an exclusive policy on start-ups (in January 2016), to gear up the start-up-specific infrastructure, including incubation centres, funding support and incentives, pro-

motion of industry–institute partnerships and bureaucratic facilitation. This is duly followed by several state governments. As of now, 19 of the 29 states in the country have introduced exclusive start-up policies.

The increasing interest of industry, particularly the corporate sector in the promotion of tech start-ups in India is another heartening development. The corporate sector is a direct/indirect source of tech entrepreneurship, human resources, seed capital, early product adopters, middle- to late-stage customers, and business/technology mentors. The leading ones, particularly MNCs, aim at enabling time-bound scaling-up of high-potential start-ups through their own accelerators. As of now, more than 20 MNCs have set up their own accelerators primarily to scale up tech start-ups in India.

The role of academia, particularly science, engineering and management institutions in the promotion of tech start-ups is steadily gaining ground. They are the source of tech entrepreneurship, human resource, and technology mentorship, among others. Further, of late, thanks to government support, institution-based TBIs are growing in number. As of now, there are more than 200 TBIs operating in India, most of which are based out of higher education institutions. The core objective is to provide a fillip to the generation of institution-based innovations leading to patents and their commercialization for venture creation.

Further, intensifying 'brain circulation' occupies a unique significance in the context of India involving start-up ecosystems. It brings entrepreneurship, finance, market, human resources, mentors and even support system providers, which together form the nucleus and five indispensable components of start-up ecosystems. The Indian diaspora, estimated at about 16 million as of 2015 and the largest in the world, has the potential to contribute significantly to the growth and maturity of tech start-up ecosystems in the country in the future.

To conclude, tech start-ups and their ecosystems are justifiably gaining increasing attention of the policy makers. Though ecosystems are largely evolving and have not yet matured, there are 'signals' which indicate that it is only a matter of time for our ecosystems to gain maturity. As a result, they would enable not only the emergence of a steadily growing number of tech start-ups, but more importantly, their sustenance and subsequent success for 'rapidly scaled-up' growth. In the process, they would contribute to the economic transformation of India through new product development, productive employment generation and income creation.

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