

Exploring Start-up Ecosystem and its Structural Impact : A Review

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EDITORIAL BOARD EXCERPT

Initially at the Time of Submission (ToS) submitted paper had a 4% plagiarism which is an accepted percentage for publication. The editorial board is of an observation that paper had a successive close watch by the blind reviewers which at a later stages had been rectified and amended by authors (Surabhi & Seema) in various phases as and when required to do so. The comments related to this manuscript are noticeable related to **Start-up Ecosystem and its Structural impact** both subject-wise and research-wise. As we all know Start-ups are effective in promoting innovation and Setting up start-ups is a driving force for the development of worldwide economy. The study has made a deliberate attempt in identify the emerging nature of start-ups and to discover factors helping in the development of start-up ecosystems. By and large all the editorial and reviewer's comments had been incorporated in paper at the end and further the manuscript had been earmarked and decided under "**Review of Literature**" category as the paper critically analyze the research studies describing the stages of start-ups, attributes of start-up ecosystem and their inter-relationship.

ABSTRACT

Purpose: Present research focus has primarily been around the management and development about the startup ecosystem framework but research on relative significance of start-up ecosystem factors are yet to be done. The purpose of the research is to identify the emerging nature of start-ups and to identify factors helping in the development of start up ecosystems

Design/Methodology Approach-Review based approach findings- The paper critically analyze the research studies describing the stages of start-ups, attributes of start-up ecosystem and their inter-relationship

Originality/Value-The study has made a comprehensive literature review of the area to understand the evolution of the field, development of startup through various stages and growth of effective start-up ecosystem. The study summarizes briefly each section, integrate the knowledge and suggest entrepreneurial and academic significance, contribution in the area of the startup ecosystem.

KEYWORDS Start-ups | Start-up Ecosystem | Entrepreneurship | Entrepreneurial Environment

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Introduction

Setting up start-ups is a driving force for the development of worldwide economy (Lederman et al., 2013)¹. Start-ups are effective in promoting innovation. In present Era, countries' potential to transform innovations, to successful ventures and creating high returns with multiple jobs is of high importance for resource utilization and to develop a quality life for its citizens (Europe 2012)².

Entrepreneurship is series of action which gives scope for novel products or services to be discovered, analyzed and exploited (Shane and Venkatamaran, 2000)³. Start-up establishments are formed by a group of two, three people having burning ideas and zeal to form new business and by the help of a small number of employees, pilot runs different possibilities to produce viable product or service and float in the market within few months of idea formation (Blank and Dorf 2012)⁴.

There is an escalation in entrepreneurship around the globe as well "outburst start-up ecosystem all over the world" (Start-up Genome, 2012)⁵. Start-ups contribute to the economic growth of a nation through an increase in employment, exports as well as the GDP. Entrepreneurship drives the economy and society of almost all nations (Brock and Evans, 1989⁶; Acs, 1992⁷; Carree and Thurik, 2002⁸).

Through time memorial the USA has been the cradle of high-growth start-ups primarily through startup ecosystems. The startup ecosystems power the high-growth start-ups through a combination of multiple factors like support to creative, marketable ideas, market potential, policy support as well as open market environment. Start-ups help in bringing structural change in an economy by initiating knowledge base products, promotes innovation, steers productive growth and employment (OECD, 2013)⁹.

While start-ups have the potential to generate jobs and contribute to regional and national economic growth, they have been identified with a high rate of failure, and therefore, have a very limited rate of survival and growth (Robinson, 1998¹⁰; Song et al., 2008¹¹). More often, they suffer from scarce resources, skeptical customers, inaccessible apt human resources, inadequate or inaccessible or prohibitively high cost, support services (Bala Subrahmanya, 2010)¹². Start-ups have certain important predictors or influential factors – internal and external (Gilbert, et al., 2006¹³; Folta, et al., 2006¹⁴). Given the internal set of factors, start-ups are based on local environment for "diverse resources" to a huge extent to maintain their operations (Romanelli and Schoonhoven, 2001)¹⁵.

The present government has taken major steps to refine ease of doing business. In fact, the 'Doing Business Report 2008' (published by the World Bank-IFC) states that "India can jump 55 places from its current rank of 120th if some of the local best practices are adopted nationwide."

A start-up is a new venture developed around a creative idea for commercial purpose. It is an innovative concept for changing the existing system. India has recently seen an increase in start-ups. For some every new business is a start-ups, while for some the technology driven and innovative businesses are startups.

Startup Definition

Start-ups may belong to any sector, manufacturing or services or both. The start-up may be using technology extensively or trying to promote technologically based products or services. A start-up may explore an inventive business model which may churn existing organizations or markets. The startup entrepreneur would have gained the knowledge about his main product/ service through a high level of self-motivation, creativity, learning capabilities and desire to succeed.

More about start up and start up ecosystem can be learned through literature review in the next section.

Author	Definition
Blank and Dorf 2012 ⁴	"A startup is a temporary organization in search of a scalable, repeatable, profitable business model."
Certo, 2003 ¹⁶	"A start-up, in general, is defined as a new venture with no previous history of operations. They suffer from the liability of newness since they are unfamiliar and without any precedence."
OECD, 2013 ⁹	"Start-ups focus on performance, using terms such as high-impact, high growth, and gazelles. The OECD defines high-growth enterprises as those with average annualized growth greater than 20% regarding growth in the number of employees or growth in sales volume over a three-year period, with ten or more employees at the beginning of the observation period. Gazelles are the youngest of these enterprises, typically in existence for less than five years."
Ministry of Commerce and Industry, (2019) ¹⁷	"An entity shall be considered as a 'startup'- a) Up to ten from the date of its incorporation/registration, b) If its turnover for any of the financial years has not exceeded Rupees 100 crore, and c) If it is working towards innovation, development or improvement of products or processes or services, or if it is a scalable business model with a high potential of employment generation or wealth creation. "
Blank (2010) ¹⁸	"An organization formed to search for a repeatable and scalable business model."
Graham (2012) ¹⁹	"A startup is a company designed to grow fast. The only essential thing is growth. Everything else we associate with start-ups follows from growth."
Stokes (1995) ²⁰	"A start-up means creating a new business, which stands alone and is not tied to other organizations, except in the normal course of trading. It does not mean that the idea is necessarily new, it is only the vehicle which is set up to exploit it."

Stages of Start-up Development

Understanding of different stages of start-up development is essential, as every stage pose a challenge for the organization survival. Many research works have been done earlier to understand the framework and model of the new firm. Each framework, the model provides insight and to draw a conclusion for it. The stages of development by different authors share several common traits but have a deviation about event, durations, etc. The author shares their distinct perspective to start-ups growth stages.

promote entrepreneurship spirit, contribute in startup process and development of entrepreneurship (Gnyawali & Fogel, 1994)²⁸.

Isenberg (2010)³¹ defines an entrepreneurial ecosystem (he uses the term “entrepreneurship ecosystem”) as a “set of individual elements such as leadership, culture, financial and human capital, which are intertwined in a complex manner”.

Greiner’s (1972) ²¹	Churchill and Lewis (1983) ²²	Aldrich, H.E. (1999) ²³	(Blank and Dorf 2012) ⁴	(Marmer et al 2011) ²⁴
Organization age –Attitude change with age of firm is required	existence stage -broadening initial customer, the initial money	Variation - reviewed the formulation of various organization structures	Customer Discovery - identify consumer need, extent of product or service capability to reach consumer needs form a business model, test the hypothesis through feedback, validate it, and to develop solution fit.	Discovery - the minimum viable product is generated. Initial funds are traced
Organization size - with expansion of business, more inter relation is required	survival stage -break even stage and increase the business size	Adaptation -the traits and techniques adopted by entrepreneurs for survival of organization	Customer Validation -scalability of business model	Validation - acceptance for product, product refinement, metrics to trace user growth is implemented
Evolution stage - smooth growth of firms	success stage -business expansion with strategic planning	Selection - the factors that led to success of organization	Customer Creation - increases its investment and sales	Efficiency - refining values proposition, revamping users’ experience, discovering scalable routes
Revolution stage - sudden change due to change in technology, expansion,management	take off stage -maintain cash debt ratio, expansion with an adequate delegation of duty	Retention - the way the path of success tend to be replicated by other entrepreneurs	Company Building - startup transforms itself to the company and makes structural changes to make large establishment.	Scale - pitch for larger funds, expand the administrative and infrastructure base
Growth stage - brings creativity, direction, decentralization, coordination and collaboration	resource maturity - amalgamation and control of financial resources, the flexibility of response as in small firms.			Profit Maximisation - Huge funding round takes place with further expansion of production and operations.
				Renewal/Decline Success leads to IPO; Failure leads to business decline

Startup Ecosystem in General

A start-up ecosystem, also commonly named as “entrepreneurial ecosystem” (Mason & Brown, 2014)²⁵, “entrepreneurial system” (Spilling, 1996²⁶; Neck et al., 2004²⁷), “entrepreneurial environment” (Gnyawali & Fogel, 1994²⁸; Fogel, 2001²⁹), or “local entrepreneurial climate” (Roxas et al., 2007)³⁰, consists of factors intermingled to

Such framework, denominated of “ecosystem”, was first coined by James Moore, who claimed that “successful business can’t evolve in vacuum, necessitating to attract resources of all types, such as capital, partners, suppliers and customers to create cooperative networks, where companies can work jointly and competitively to support new products, satisfy customer needs, and eventually incorporate the next round of innovations” (Moore, 1993)³².



In general, a typical entrepreneurship ecosystem has innumerable features. The following organizations and activities are the most active ones: Universities, Venture Capitalists, Angel Investors, Incubation Center, Accelerators, Crowd funding, Meetup groups, Services such as legal, financial and consultancy, Competition of start-ups and other supporting organizations.

The research studies are mainly divided into two outlooks to study startup ecosystem: **Attribute Centred Research and Framework Centred Research.**

Start-up Ecosystem Attributes Centered Research

Many researchers look at the perspective to assure specific city; the region is enriched with requisite features to have **start-up clusters, funding support, university or educational institute of excellence (Whittington et al. 2009³³; Cooke 2002³⁴)**. Silicon Valley has 6,000 innovative companies. Unique eleven characteristics, values, goals for a healthy ecosystem of Silicon Valley are regarded as Mecca of start-ups. The attributes are **high ranked university (Stanford University); Highly motivated entrepreneurs, investors, and academicians; Ethical cycle of Venture capital industry where entrepreneurs who have gained success invest their exit earnings in new ventures; welfare ethics and quality life with non-hierarchical communication models; entrepreneurial risks embraced; well established infrastructure; savvy entrepreneurs; strong network with free flow of ideas; established patent industry; fearless, risk-taking, idea-driven, resilient people; encouragement for immigrants having skills to shift their base to urban areas (Piscione 2013)³⁵** The Silicon Valley successful culture is based not only because of **skilled labour, infrastructure, and technology** but people have **distinctive behaviour** in Valley (Hwang and Horowitz 2012)³⁶.

The advantageous seven attributes of New York City contributes towards its successful start-up ecosystem which includes **easy access to capital, in proximity to world financial centre; Tie with Cornell University and Technion and ambitious Major Bloomberg program to convert New York into biggest innovation hub; tolerance involved for high risk and failure; high networking and love for community; New York Tech Meetup having more than 36,000 members; a big investor group spirit to make good to society; bigger community with approach to global business (Cometto and Piol 2013)³⁷**. Leading factors endowed in Washington D.C. start-ups ecosystem are its **nascent entrepreneurs, support from society, investors support, universities encouraging entrepreneurial culture; start-up support services (Feldman 2001)³⁸**. Local Governments in the USA assisted in investments to start-ups to enhance start-up ecosystem culture with flexible policies comprising guidance, infrastructure, business investments and entrepreneurship education. However, the magic of highly

established entrepreneurial ecosystems can't be established. Very few internationally successful start-ups have emerged in the USA (Lerner 2009)³⁹.

(Feld 2012)⁴⁰ in his Boulder thesis and book 'Startup Communities' found four presuppositions necessary for vibrant start-up community: (1). **Entrepreneurs driven start-up community** instead of decisions by policymakers, professors etc. 2) **Penetrative boundary** in society especially among serial entrepreneurs and nascent founders 3) **Organized events** which involve people in the entrepreneurial state of affairs. 4). **The commitment of entrepreneurial community trendsetters** for minimum twenty years. The university of Colorado Boulder provided only indirect support to start-ups by providing space for meetings and events. Ecosystem capacity to enhance innovation drives from a talent pool of human capital, belief beyond the societal barrier, inspiration beyond momentary logic, experiential learning among people and culture that promote to work together (Hwang and Horowitz 2012)³⁶. **A helpful culture** like tolerance of risk and mistakes, entrepreneur personality, entrepreneur income; **policies and leadership** through government incentives, government support for start-up etc; **finance** support from angels investors, venture capital, microloans, public capital markets; **human capital** in form of talent pool, training programs; **Strong network among stakeholders; Infrastructure support** comprise basis of successful start-up ecosystem (Isenberg (2011)⁴¹.

Metropolitan cluster and Sector Specific for flourishing requisite **skills such as IT, Education** is major factors of start-up ecosystem (Reynolds and Storey 1994)⁴². However (Kakati 2003)⁴³ found that **Entrepreneur traits, resource-utilisation potential, competitive strategy** form key attributes of success for start-up growth while analysing twenty-seven venture capitalists according to their experience rated one successful and one unsuccessful venture in six areas i.e. entrepreneur traits, resource-utilisation potential, competitive strategy, product features, market traits and financial return. Products compared to competition bring success rather than a unique approach that firm tries to bring. **Accommodation of knowledge from all sectors and regions** has a positive influence on start-up survival and growth as a rapid change in technologies can either drive start-up success or lead to closure (Folta 2006)⁴⁴. For start-up survival funding at the right time and amount plays a vital role. Funds from **Venture Capitalist, Angel Investors, and support from Incubators and Accelerators** form 90% of aggregate funds invested in start-ups (Joshi, K. & Satyanarayana, K. 2014)⁴⁴. The rise in **funding** has a productive transformation on the development of start-ups. **Policy changes** which increase **institutional credit** would help in the creation of new start-ups and increase exports (Kasturi, S.V. and Bala Subrahmanya, M.H. 2014)⁴⁵ The rise of **New Technology Ventures (NTV)** as well as the development of start-up ecosystem improves

employment contribution and growth of the economy (Bala Subrahmanya, M H 2015)⁴⁶. Development in the talent pool of human resources increases the number of start-ups in the region. Start-up firms which concentrate on intermediate goods and services fuel the growth of the regional economy. The start-ups with a high rate of returns would encourage other entrepreneurial start-ups (Gries & Naudé, 2009)⁴⁷.

The above Attributes-centred research attempts to find the presence of factors across regions, cities that attributes essential for growth and survival of start-ups, be physical infrastructures such as university of excellence promoting entrepreneurial culture (Feldman 1994)⁴⁸, creative workforce (Florida 2002)⁴⁹, or favorable region features (Saxenian, A. 1994)⁵⁰. The key attempt of such research is to determine such attributes. These attempts will draw the focus of region or city to attain and develop attributes to flare entrepreneurship activities for swift economic growth.

For Attribute-centered research, following attributes are necessary to for startup clusters (Feldman 1994⁴⁸; Saxenian 1994⁵⁰; Cooke 2002³⁴; Kakati 2003⁴³; Isenberg 2011⁴¹; Feld 2012⁴⁰; Florida 2002⁴⁹; Braunerhjelm 2006⁵¹; Whittington et al 2009³³; Smilor et al 1990⁵²; Piscicone 2013³⁵; Hwang and Horowitz 2012³⁶; Cometto and Piol 2013³⁷; Feldman 2001³⁸)

1. Entrepreneurial Culture
2. Skilled Human Personnel
3. Favourable Policies
4. Beneficial City Features
5. Education Excellence Research University
6. Market
7. Funding
8. Rich network connection

Attributes of Startup Ecosystems

Funding

Funding is the lifeline of startup clusters. Financial access is the biggest hurdle to achieving entrepreneurial growth in India (NKC Entrepreneurship Report). Avenues of seed capital are unorganized and mainly government is initial seed capital provider in India (World Bank 2015).

Venture Capital and private equity fund have shown a notable increase in India. However, Investment Trends by venture capital and private equity are basically on established firms having high potential and involves high risk (Nahata,

2008)⁵³. Venture Capitalist helps new ventures to overcome problems related to new organization formation and protect them from failure through expertise and in investment (Stinchcombe, 1965)⁵⁴. They provide strategic guidance, open new avenues, help them to acquire legal status, play a major role in startups decisions and are a board of directors of the company (Berglund 2007⁵⁵; Elfring & Hulsink 2003⁵⁶). In India, Venture Funds are regulated by SEBI, 1992 and 1996. In India, there are approximately 200 VC registered with SEBI. According to SEBI regulations, Venture capital fund means fund instituted in the form of a company, trust which lend money as a loan, donation, and securities for investment with regulated guidelines. According to Newscorp VCEdge, a risk capital data monitoring service, Venture capital deals comparison of first six months of year 2014-2016 found that Venture deals were 167 of \$863 million on first six months of 2014, which rose to 278 deals of value \$2.8 billion in first six months of 2015 but declined to 183 deals of value \$2.8 billion. The fall is due to the focus on unit economics and cash crunch for later stage companies (Chanchani, 2016)⁵⁷.

Angel Investor

Angel Investor provides initial capital to early stage ventures. Angel investor invests money in startups in debt or equity form from funds possessed by him. Investment by angel helps to make money and participates in new learning, acts as motivator for startups and community (Shane 2000)³. In India startups has raised Rs 113.6 crores through angel investment with 69 deals in year 2016. The total number of deals on angel investments were 172 in 2014 which has increased to 368 deals in 2016.

Beneficial city features

Beneficial city features play as a catalyst for firms growth and give an edge to firms from the one located in other regions (Casper 2007⁵⁸, Saxenian 2001⁵⁹, Feld 2012⁴⁰, Piore et al 1994⁶⁰). This factor has been recognized as one of the important features and consistently recognized by researchers to make its mark in regional economic success and decline at the times of economic setback and progress (Safford 2009⁶¹, McDermott 2007⁶²). The local cultural embeddedness of entrepreneurship sparks innovation in the region and encourages policy makers and people associated with the ecosystem to enhance growth through consistently reforming the system (Herriegel 1993⁶³, Storper 1997⁶⁴, Uzzi 2005⁶⁵). Urban agglomeration and discipline expertise are important characteristics of startup region (Reynold and Storey 1993)⁴². External knowledge gets easily accommodated in some of the entrepreneurial region (Cooper and Folta 2000)⁶⁶.

Favourable policies

Favourable policies by government play an important role in startup growth. Government actions in form relaxation



of taxes, policies initiative, and encouragement through entrepreneurship program plays key role in firms' growth and survival (Gurley et al.2008)⁶⁷. A higher tax on self employment demotes entrepreneurship. Indian Government has launched action plan on 16th January 2016 to promote startup. Startup friendly policies by present government are: Single window mechanism for Startups, no Capital Gains tax for startups, special incentives for women, bringing incubators investing in particular sectors, startup profits not taxable for first three years, patent fees for startups reduced to eighty percent and Rs 10,000 cr fund for startups @ 2500 crore each year for the first 4 years. (Startup Action Plan 2016)

Entrepreneurial culture

Entrepreneurial culture is necessary for startup growth. An entrepreneur capacity to take risk, drives to achieve goals, accepts ambiguity and thrives to give full effort and time to make organization a successful venture (Schere 1982⁶⁸, Mc Clelland 1961⁶⁹, Aldrich 1999²³). Firms' ability to learn, strategy for growth, is essential features to encourage entrepreneurial growth (Sandberg 1986⁷⁰, Geroski 1995⁷¹)

Skilled personnel

The skilled personnel of the age between 18-34 years provide resourceful human capital to technology based company. (Cortright and Colleta 2006)⁷². Skilled personnel in different domains provide rich, diverse experiences and helps in generating high-quality life (Saxenian 2001⁵¹, Breshnahan 2001). Rich human capital provides an edge over to confront barriers related to finance as educated people know how to find more avenues to obtain credit, are skillful in forming network and able to find domains to market their products (Kim et al.2006)⁷⁴.

Network

Clusters help in technology transfer and encourage learning (Cooke 2002³⁴, Lester and Piore 1994⁶⁴, Breznitz 2005⁷³). With increased competition, there is a consistent flow of information and enhance learning and innovation (Asheim and Conenon 2006)⁷⁶. The cluster development helps to build social capital which has multiple fold effect in the growth of startup ecosystem (Lencher and Leyronas 2012)⁷⁷. Multiple ties with a different organization with the entrepreneurial region help in rapidly transmitting collective information and enable startup ecosystem in achieving common goals (Putnam1993)⁷⁸.

Incubator

India has 120 incubators and science parks and has funded 2700 companies till 2014 (Fuelling Entrepreneurship 2014). NSTEDB has established 87 Technology based Incubator (TBI) with universities and research institute collaboration

and has invested 100 crores. Incubated companies has earned 595 crores till 2014 (Fuelling Entrepreneurship 2014)⁷⁹.

Accelerator

Accelerator program designed for 3-6 months to take scalable startup to next level.. Besides incubating the startups, its structured program helps the startups to maintain success. The accelerator besides mentoring the startups help in accomplishing other goals too. The accelerator program runs in batches. The help startups in each stage, from idea development to finding new business opportunities, providing network to gain higher opportunities to scale. It lays hands on team development and host investors meet for start up to pitch and scale. (DST NIDHI)

(Sharma, Joshi, & Shukla, 2013)⁸⁰ found that the mortality of the start-ups attending the Accelerator programme is reduced to 20%. Fund raising chances of start-ups through accelerators increase to 78%. Accelerated start-ups have higher chances of getting series A, which is the next round funding. Chances of Accelerated start-up getting acquired are high.

Universities

Universities and educational institutes having entrepreneurship culture helps in the spin-off and provide skilled labor (Breznitz and Alan 2008⁸¹, Huggins et al 2012⁸²). Research institutes advance innovation and capabilities. Theses institutes provide skilled personnel and enable to develop clusters (Florida 2002⁴⁹, Hervas et al. 2012⁸³)

Conclusion and Recommendation

Entrepreneurial ecosystem approach cannot be copied from other established system without understanding its evolution under local context (Isenberg 2010)³¹. The situational consideration of ecosystem helps to develop insight on understanding functioning or dis-functioning of the system. The Entrepreneurial or start-up ecosystem is path dependent, and existing structures create barriers in developing new path (Henning et al. 2013)⁸⁵.

Various researchers tried to scale entrepreneurial ecosystem. Feld (2012)⁴⁰ described cities (Boulder City), (Saxenian 1994)⁵⁰ consider region (Silicon Valley) and studied other regions, (Hamel 1999)⁸⁶ perceived companies and (Senor and Singer 2009)⁸⁴ studied countries (Israel's ecosystem. All outlooks for measuring ecosystem are relevant, and can be encapsulated in cities and shared among the nation. The entrepreneurial ecosystem acts like a magnet. Europe shares international boundaries with many countries and attracts entrepreneurial activities from all interlinked nations (Holmes 2014)⁸⁷. Corporate entrepreneurial ecosystem can reach to many communities in cities and villages. City-

based entrepreneurial ecosystem also stretches its reach to regional, national and international level. The policy level changes may have a conscious and unconscious effect on all levels (Bosma and Stam 2012)⁸⁸. Entrepreneurial ecosystem flourishes through interaction and connections which could be between the ecosystem builders or between communities, regions, nation and international ecosystem.

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Reviewers Comments



Reviewer's comment 1:

The paper is crafted in a structured manner. The introduction portion is quite impressive.

Reviewer's comment 2:

The paper has tried to cover almost all the attributes of start-up ecosystem. And every attribute has been explained through supportive studies.

Reviewer's comment 3:

Studies on management and development about the startup ecosystem framework are the need of the hour. And author has tried to satisfy this need by the manuscript which critically analyze the research studies describing the stages of start-ups, attributes of start-up ecosystem and their inter-relationship.

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