

The book cover features a large, light-gray circular area in the center, surrounded by a dark blue border. A white circular path with a dashed line and an arrow at the top curves around the central area. Along this path, several yellow icons are placed: a rocket, a book, a lightbulb, a laptop, an envelope, and a cursor arrow pointing at a cloud. The title 'HIGH-TECH INTERNET START-UPS IN INDIA' is written in the center in blue and orange capital letters. The author's name 'H. S. Krishna' is written below the title in white capital letters.

HIGH-TECH INTERNET START-UPS IN INDIA

H. S. Krishna

High-tech Internet Start-ups in India

Technology entrepreneurship has been receiving growing importance as an effective instrument to promote national economic growth, with empirical researchers and policymakers. India has emerged as the third-largest base for high-tech start-ups in the world. Although there is a surge in start-up creation in India, little is known about the vital factors that are required for these start-ups to survive, sustain, and grow into large enterprises. There is limited exploration on the structure, process, and strategies adopted by high-tech start-ups in existing literature. This has resulted in insufficient understanding of the high-tech start-up life cycle, particularly in emerging economies such as India. This book is an attempt to provide this information based on true facts and verifiable analysis. It reviews the entrepreneurial, firm-specific, and external environment-specific aspects that influence the key life cycle stages of high-tech start-ups and identifies the key factors that influence each milestone. By analysing empirical data, it provides a multidimensional framework to understand the life cycle of high-tech start-ups in India.

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High-tech Internet Start-ups in India

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To Nandini and Anagha

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Preface

Start-ups have captured the imagination of people today across the world. Many myths, wrong perceptions, and false notions of success and glory are being propagated and worse – people tend to believe these without verifying. This book is an attempt to state the facts, based on true, verifiable information and analysis of what it takes for an entrepreneur to set up, sustain, and grow new ventures in the digital world today, particularly in the context of India. Although this book is academic in nature, there is enough information for all types of audience to gain value out of it.

For academics, it offers rich insight into how to pursue systematic research and inquiry in the relatively new phenomenon of start-ups and their life cycle. This is meant to be an introductory and exploratory effort in analysing the life cycle of high-tech start-ups in India. The topics dealt with in this book are fairly broad in nature, and each of these topics deserve a much more nuanced examination. This book will be a handy reference for the undergraduate, postgraduate, and doctoral programmes in economics and entrepreneurship. For students and prospective entrepreneurs, this book provides unbiased inputs on the factors that a prospective entrepreneur needs to be equipped with – to pursue the journey of entrepreneurship in the high-tech sector of India.

For practising entrepreneurs, the book will help to reflect on their current state of affairs and help them in taking any required measure in due course. Apart from entrepreneurs, all major stakeholders of the entrepreneurial ecosystem, such as business and technology incubators, accelerators, VC and angel/seed investors, and multinational companies and large enterprises that have corporate development/mergers and acquisition (M&A) teams and start-up specific programmes/initiatives, will find the book a handy reference and resourceful input to the various activities that they are pursuing.

For policymakers, the book provides insight into the necessary and sufficient aspects to be taken care of during policy formulation and evaluation, to create regional entrepreneurial hubs, and nurture them. In particular, government

institutions, government affiliated entrepreneurship and skill development training institutes, and government-funded R&D institutions and programmes where entrepreneurship is being encouraged will benefit from the dissemination of insights obtained from the systematic study.

The high-level flow of each chapter is as follows:

Chapter 1 provides the context, key concepts, and definitions of start-ups, what they are and what they are not, and their relevance to the economy. Finally, the evolution of policymaking around start-ups across the world and in India, in particular, is discussed.

Chapter 2 would be particularly useful to researchers, academics, and students. One can understand all aspects of the research methodology, starting from binding the scope of the research problem, identification of the research objectives, describing the data sources, research instruments, and definitions of key parameters to be used for the study to providing a brief about the different methods of statistical analysis for the evaluation of proposed hypotheses.

Chapter 3 is a light read relative to the other chapters. It provides an overview of the various characteristics and aspects of the start-ups and entrepreneurs who were contacted for the purposes of the study. Aggregate details such as the distribution of start-ups based on year of incorporation, number of founders, gender of founders, target market segment, location of operations, and entrepreneurial exposure are provided to begin with. Later, some initial statistical analysis is performed to understand how one parameter of the start-up or the founder impacts the other in isolation. For those interested in the micro aspects and interplay of factors affecting the start-ups and their operations, these types of analyses provide them some useful insights.

Chapters 4, 5, 6, and 7 form the core part of this book. Each of these chapters analyses one of the key milestones in the start-up life cycle using a consistent approach. To begin with, the readers are presented with the current state of knowledge about the milestones in the start-up life cycle. Next, the hypotheses that are formulated, based on the literature review, are discussed. This is followed by a section which details how the quantifiable variables and measures are defined to scientifically validate the hypotheses related to the particular milestone of high-tech start-ups life cycle. Later, the results of statistical analyses are discussed. In all these chapters, a visual form of initial analysis is presented for each milestone/set of hypotheses being tested. Post that, the actual results of the statistical analysis are described, followed by the analysis and interpretation of the results – including the implications of the results. Each chapter summarizes the key results and interpretations obtained on account of the analysis of each of the milestones of the high-tech start-up life cycle. For the more statistically inclined, appendices at the end of each chapter provide further details of the statistical test results

obtained. The readers need to understand that although the flow of each of these chapters is homogeneous, each chapter deals with different objectives, data sets, and methods of analyses.

Chapter 8 provides the summary of the analyses and their implications to the diverse set of audiences, such as entrepreneurs, students, academics, and policymakers. It also highlights limitations of the scope of study presented in the book and discusses areas for further research and analysis.

This book will meet its intended purpose if any of the readers find value and benefit from the information provided. If any discrepancies or errors inadvertently remain in this book, I am alone responsible for the same.

27 April 2019

H. S. Krishna

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1

Introduction

Preamble

New and young businesses, referred to now as ‘start-ups’, have gained growing relevance and importance among the policy makers and leaders of economies worldwide. In particular, as the developed and developing economies make the transition to knowledge-based economies, the high-technology (high-tech) sector has been the primary engine in enabling this transformation. The promotion of high-tech start-ups helps economies to generate new products, services, and business models that differentiate the nations’ output from the rest of the world and enhances the economic progress of these countries (Saxenian 2002).

Therefore, the field of high-tech start-ups has been receiving much importance within the entrepreneurship literature from the 1980s. Gries and Naude (2008) observed that these new, small firms are more likely to grow (Johnson, McMillan, and Woodruff 2000; Lingelbach, de la Vina, and Asel 2005), create new jobs (McMillan and Woodruff 2002; Audretsch, Keilbach, and Lehmann 2006), and promote new and flexible organizational forms (Kim, Aldrich, and Keister 2006). In particular, small high-tech start-ups have been recognized as being the major drivers of job creation and innovation and thus economic growth (Birch 1979; Baumol 2002; Kirchoff and Spencer 2008).

In the USA, the 1970s and 1980s had the most impact and contribution to employment and economy from high-tech start-ups. The advent of the Internet in the USA and incremental successes in the biotechnology industry disrupted the marketplace through the creation of new start-ups that leveraged these technologies to provide new products and services in ways that were not possible before. At its peak, these entrepreneurial companies contributed 20 per cent of US employment in the 1980s. Despite being in recession, between

March 2009 and March 2010, 394,000 new businesses were formed, creating 2.3 million jobs in the USA (Mutikani 2012).

Even emerging economies have benefited on account of high-tech industry-based growth strategies. Taiwan's contribution to total domestic output from the high-tech sector increased from 9.7 per cent in 1980 to 28.5 per cent in 2003. South Korea's high-tech manufacturing contribution to the total domestic manufacturing output jumped from 9.6 per cent in 1980 to 21.5 per cent in 2003 (Commission on Strategic Development 2007). In India, an average of 400 new technology start-ups were created during 2009–2012 (Microsoft Accelerator India 2012).

The rapid proliferation and use of the Internet across the world have accelerated the process of globalization, aided by disruptive technological changes in just a matter of a decade and half (Startup Genome 2012). Kane (2010) ascertained that in the USA, start-ups were responsible for all the new job creations for 21 out of the past 28 years (75 per cent of the time frame of the study). Some of the leading companies in the technology industry today, such as Apple, Cisco, eBay, Qualcomm, Intel, were incubated as tiny start-ups during their formative years (Barringer, Jones, and Neubaum 2005; Paulraj 2012).

Start-ups have started to contribute in such massive proportions to economies worldwide on account of macroeconomic changes, including the lowering of entry cost for start-ups and the maturing of the institutional finance industry (venture capital [VC] firms, seed and angel investments by firms and high net-worth individuals). Further, the ability to facilitate rapid and global adoption of a new product or service, and better knowhow of how to manage these new and young businesses during their initial years of inception and operations have also paved the way for enhancing the contributions of start-ups to the economies (Startup Genome 2015).

From the Asian perspective, the overall VC investment just for Q2 2015 was over US\$10 billion (1 billion = 100 crore), registering a 45 per cent year-on-year growth. Asian Internet and mobile start-ups took about 82 per cent of the worldwide VC funding in Q2 2015, with the Asian region attracting approximately US\$33.5 billion VC funding across the past five quarters (Venture Pulse 2015). In India, companies such as Flipkart, MakeMyTrip, and InMobi are making their presence felt in the global marketplace, attracting more than US\$1 billion valuations (Nambiar 2011). As of 2015, there were eight home-grown unicorns (start-ups that are valued at US\$1 billion or more) operating in India (*The Times of India* 2015).

According to NASSCOM (2014), India has approximately 3,100 start-ups operating in the country, on account of which it has now been recognized as the third-largest base for high-tech start-ups in the world. In the year 2014 itself, about two start-ups were created in India every day – a 100 per cent increase from 2013 – which indicates the momentum building up in this sector in the country.

While the preceding discussion provides a glimpse of the activity around high-tech start-up emergence, we need to understand that these start-ups have a very high mortality rate (Bala Subrahmanya 2010). The contribution to innovation, job creation, and economic growth, as outlined in the preceding discussion, are from those start-ups that are able to brave the uncertainty and come out successful. Storey (1985) concluded that the net job creation was confined to a very tiny population of start-ups that were able to survive the initial hiccups in their operations. He estimated that only about 4 per cent of the small entrepreneurial businesses that started during the previous decade of his study created about 50 per cent of the employment in the economy. This estimation was further supported by Reynolds and Miller (1988), who explored the linkage between new firm formation and their corresponding contribution to employment in Minnesota, USA.

The contributions of these surviving small entrepreneurial firms to the economy can be better understood if we can comprehend the unique set of constraints these firms face along the life cycle. Start-ups have to deal with the liability of newness, because they are trying to create a unique offering that has no precedence (Stinchcombe 1965; Baum 1996; Certo 2003, Bala Subrahmanya 2010). Since this offering is new, there is a considerable degree of uncertainty regarding its future. The degree of uncertainty (market based and technological) and the volatile nature of the environment that they operate in are key factors that can be used to describe high-tech start-up firms (Mohr, Sengupta, and Slater 2011).

More often, these start-ups are created on a small scale and with limited resources. These ventures often face large and experienced competitors, powerful suppliers, sceptical customers, and scarce resources. Therefore, their ability to withstand sustained losses is usually very limited. Given this, researchers have observed that start-ups have a high failure rate relative to established firms (Hannan and Freeman 1984; Stinchcombe 1965; Singh, House, and Tucker 1986; McDougall, Robinson, and DeNiso 1992; Hay, Verdin, and Williamson 1993; Robinson 1998; Bala Subrahmanya 2010).

Financial capitalization is another important factor contributing to the formation of new high-tech start-ups. Cohen and Levin (1989) observed

that when capital market imperfections make it difficult for entrepreneurs to secure funding, the chances of emergence of new start-ups are not very likely. Shane and Venkataraman (2000) observed that start-ups emerge when opportunities are more uncertain (Casson 1982), when opportunities do not require complementary assets (Teece 1986), and when opportunities destroy competence (Tushman and Anderson 1986).

Blank (2010) observed that most start-up founders, especially those with prior corporate experience, failed because they tried to apply principles that worked well for them in the context of a large enterprise as they started their new ventures. For example, he explained that most start-ups failed due to the inability to onboard paying customers during the initial stages of operations, and not due to the failure of product development. If a feature or an offering is built on time as per the planned budget with highest quality, good design, and navigation capabilities, but no one from the customer segment is interested in using the offering and paying for it, it just means that start-ups are executing flawlessly on a bad plan.

Despite the high failure rate of high-tech start-ups as illustrated earlier, these firms have played an important role in transforming advanced economies across the world. However, most studies thus far have treated high-tech start-ups synonymously with small businesses (Barringer and Ireland 2008). The unique nature of high-tech start-ups and the key factors that influence their life cycle, particularly in emerging economies like India, have not been examined in detail (Bruton and Rubanik 2002; Song et al. 2008). The present study, therefore, assumes significance in this context.

Key Concepts and Definitions

The study of start-ups provides context to examine and interpret the theories of entrepreneurship. This is primarily because start-ups are a vehicle of the acts of entrepreneurship or institutional arrangements for demonstration of entrepreneurship by an entrepreneur (Shane 1995; Sarasvathy 2004). Prior to understanding the key concepts and definitions that are closely related to high-tech start-ups and their life cycle, it is important that we understand the definition of entrepreneurship in the context of our study. For the purposes of our study, entrepreneurship is defined as the pursuit of opportunity without regard to currently controlled resources (Stevenson and Jarillo 1990).

It is not necessary that every entrepreneurial action always results in the creation of a new firm. The proponents of the opportunity discovery and

exploitation theory argued that creation of new firms and sale of opportunities to existing markets constitute two distinct methods of opportunity exploitation (Shane and Venkataraman 2000). There has been a considerable number of studies on the entrepreneurial action and exploitation of business opportunities made by big and established companies. Pinchot (1985) introduced the term *intrapreneurs* to describe the entrepreneurially oriented managers in big companies. Casson (1982) and Amit, Glosten, and Mueller (1993) explained the phenomenon of entrepreneurial occurrence within an existing organization. Barrow (1998) discussed the example of how a large company such as 3M encouraged one of its managers to create and establish a very profitable post-it product by the way of *intrapreneurship*.

Covin and Slevin (1991) coined the term 'corporate entrepreneurship' to explain the entrepreneurial orientation of established firms. Barringer and Bluedorn (1999) defined *entrepreneurial intensity* as a measure of the entrepreneurial activity by an established firm. They explained that firms fall along a continuum that ranges from highly conservative to highly entrepreneurial. The entrepreneurial intensity of the established firm would help in positioning the firm in a particular position along the stated continuum.

While the literature discussed thus far provides a good overview of how the opportunity exploitation occurs in existing markets, it is the former approach of new firm creation which has gained much traction and interest in research circles over the last few years. The increased focus on a particular set of small entrepreneurial firms or start-ups is due to the impact and contributions of these firms to economic growth, job creation, and innovation. Before we delve deeper into discussing the contribution of these small entrepreneurial firms to the economy, it is pertinent to understand the different types of new firms that exist in an economy and their characteristics. The next section accordingly provides insight on the types of small business firms.

Difference between Small Businesses and Start-ups

The terms 'small businesses', 'new ventures', 'new firms', and 'start-ups' have often been interchangeably used in literature. This is primarily because of the context of the earlier studies examining these entities varies significantly from economics to sociology, organizational behaviour, to name a few. It is, therefore, important to clarify and define these terms more precisely for use in this study.