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Entrepreneurial India

Welcome to the May issue of the *Technology Innovation Management Review*. We welcome your comments on the articles in this issue as well as suggestions for future article topics and issue themes.

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Overview

The *Technology Innovation Management Review* (TIM Review) provides insights about the issues and emerging trends relevant to launching and growing technology businesses. The TIM Review focuses on the theories, strategies, and tools that help small and large technology companies succeed.

Our readers are looking for practical ideas they can apply within their own organizations. The TIM Review brings together diverse viewpoints – from academics, entrepreneurs, companies of all sizes, the public sector, the community sector, and others – to bridge the gap between theory and practice. In particular, we focus on the topics of technology and global entrepreneurship in small and large companies.

We welcome input from readers into upcoming themes. Please visit timreview.ca to suggest themes and nominate authors and guest editors.

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Contribute to the TIM Review in the following ways:

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About TIM



The TIM Review has international contributors and readers, and it is published in association with the Technology Innovation Management program (TIM; timprogram.ca), an international graduate program at Carleton University in Ottawa, Canada.



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Editorial: Entrepreneurial India

Chris McPhee, Editor-in-Chief

Dharmesh Raval, Guest Editor

From the Editor-in-Chief

Welcome to the May 2016 issue of the *Technology Innovation Management Review*. This month's editorial theme is **Entrepreneurial India**, and I am pleased to introduce our guest editor, **Dharmesh Raval**, Dean of the Faculty of Management and Professor and Director of the School of Management at RK University in Rajkot, India.

The timing of this issue also coincides with the launch of a new initiative to provide knowledge and opportunities to Canadian and Indian technology startups to enter the Indian or Canadian markets. The Canada-India Acceleration program (carleton.ca/india/startup-network) is a partnership between the Canada-India Centre (carleton.ca/india/) at Carleton University in Ottawa, Canada, and Lead To Win (leadtowin.ca), a business-development program and business ecosystem led by Carleton University. In autumn 2016, the first cohort of entrepreneurs will travel to their counterpart countries where they will receive information about entering the market, seeking funding, and connecting with investors, and they will be hosted in a leading incubator for three months.

In addition to four India-focused articles, this issue also includes a summary of a recent TIM Lecture given by **Elizabeth Collinson**, a Project Officer in the Outreach Program of the Canadian Intellectual Property Office (CIPO; cipogc.ca). The lecture provided an introduction to intellectual property with a particular emphasis on its relevance to entrepreneurs in Canada.

We hope you enjoy this issue of the TIM Review and will share your comments online. We welcome your submissions of articles on technology entrepreneurship, innovation management, and other topics relevant to launching and growing technology companies and solving practical problems in emerging domains. Please contact us (timreview.ca/contact) with potential article topics and submissions.

Chris McPhee
Editor-in-Chief

From the Guest Editor

It is my pleasure to be the guest editor for this special issue of the TIM Review on **Entrepreneurial India**. The authors in this issue contribute to the conscious agenda for developing the "thinking" behind creating a more enterprising and innovative India through entrepreneurship.

This issue marks the first intellectual collaboration between Carleton University in Ottawa, Canada, where the TIM Review is published, and RK University in Rajkot, India. Both universities are increasingly involved in entrepreneurship research and training and provide strong support to campus startups. Given the reciprocal interest in the two countries in promoting collaboration, trade, and pathways for global entrepreneurship, it was natural to work together on this issue focusing on entrepreneurship in India.

In the first article, **Alok Chakrawal** from Saurashtra University and **Pratibha Goyal** from Punjab Agricultural University discuss the challenge of branding (or re-branding) India as a nation. The article describes how the world perceives India, and therefore its businesses, while providing a "big picture" view of the current economic standing of the country among its peers around the world. It highlights areas of conscious efforts by the business community and the central government, whose potential contributions can strengthen Brand India through major economic and non-economic policy initiatives.

Next, **Nikhil Gokhale**, Associate Director of the Faculty of Doctoral Studies & Research at RK University in Rajkot, examines research-inspired entrepreneurship in India. In his article, he describes how the culture in India is moving on from merely seeking steady employment to engaging in entrepreneurship and its inherent risks. He is optimistic about the future and the country's current position of standing on the threshold of an entrepreneurial culture. With innovation, funding, and patents, entrepreneurship in India may be set to take a big leap.

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Then, **Shiv S. Tripathi**, Assistant Professor of Strategic Management at the Management Development Institute in Gurgaon, analyzes the types of open innovation activities engaged in by manufacturing-based firms in India. The article compares the collaborations each industry has entered into to identify the industries that are more open to take risks by collaborating with other parties in multiple ways. In doing so, the article provides insights into the changing mindsets of Indian companies as they increasingly more open and entrepreneurial working practices.

Finally, I answer the question, "What is the role of higher education institutions in promoting entrepreneurship in India?" by looking at the current scenario of entrepreneurship education. This Q&A covers the role of business schools, the importance of incubation and mentorship, and the key challenges in promoting entrepreneurship in India. A key message is that the role of higher education institutions is changing, and that the increasing training and support they are offering to student entrepreneurs is a means of contributing to the national economy.

It has been an enriching learning experience to work with the contributors to this special issue, including Chris McPhee, the journal's Editor-in-Chief. We also greatly appreciate the initiating and coordinating efforts of Punit Saurabh, Assistant Professor at the School of Management and Coordinator of the Entrepreneurship Cell at RK University, without whom this issue would not have been possible.

With this special issue, our intention is to reflect on and evaluate the evolution and emergence of entrepreneurship and innovation in India. We hope you enjoy reading the articles and that their insights will have relevance not only to those engaging with Indian businesses and researchers, but also to those facing similar opportunities and challenges in other developing countries. We will look forward to hearing your views.

Dharmesh Raval
Guest Editor

About the Editors

Chris McPhee is Editor-in-Chief of the *Technology Innovation Management Review*. He holds an MASc degree in Technology Innovation Management from Carleton University in Ottawa, Canada, and BScH and MSc degrees in Biology from Queen's University in Kingston, Canada. Chris has over 15 years of management, design, and content-development experience in Canada and Scotland, primarily in the science, health, and education sectors. As an advisor and editor, he helps entrepreneurs, executives, and researchers develop and express their ideas.

Dharmesh Raval is Dean of the Faculty of Management and Professor and Director of the School of Management at RK University in Rajkot, India. His teaching and research interests include entrepreneurship, financial performance measurement and analysis, and related areas. He has presented research papers at several national and international conferences and has authored articles in reputed journals. He received his PhD from Saurashtra University in Rajkot. His academic experience includes over 15 years of teaching, research, academic-administration, and industry-academia interface experience in the areas of business management and commerce. He has been on the boards of Rajkot Commodity Exchange (Government of India) in Rajkot and Rajkot Management Association (AIMA) in past. His interests include designing new academic courses and engaging in business-support activities for startups.

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Creating Brand India: Strategies, Issues, and Challenges

Alok Chakrawal and Pratibha Goyal

“ Brand India has to identify its core product identity... we have to start looking at what we want to stand for.”

Kurush N. Grant
Former Executive Director of ITC

Just like a product, person, or institution, a country also has an impression in the minds of people. A brand distinguishes the product of one seller from those of the others. With the Indian Prime Minister's recent call to "Make in India", brand building is receiving more attention and momentum in the country. India is the largest democratic country with the highest GDP, and it is becoming a favourable destination for the global investment giants. But, despite various strengths and successes in image building, the country faces challenges in creating a sustainable, conducive environment for making India a production hub of the world. Bureaucracy, corruption, delay in clearance of business proposals, ethical standards and work culture, tax reforms, political interventions, socio-economic barriers, regionalism, etc. are some of the challenges that must be coped with. This article examines these various issues and challenges that must be overcome in creating Brand India.

Introduction

A person, an institution, or even a country leaves an impression in the mind of perceiver. This impression reflects the brand – what distinguishes one person, institution, or country from another. In India and beyond, country-level brand building has been receiving significant attention ever since Indian Prime Minister Narendra Modi's 2014 call to "Make in India" (DIPP, 2016). The initiative is designed to encourage multi-national and national companies to manufacture their products in India, thereby transforming the country into a global design and manufacturing hub. Make in India has become "a rallying cry for India's innumerable stakeholders and partners" (DIPP, 2016) and is a key aspect of the country's future brand. Thus, it is quite pertinent to understand India's image in the minds of the citizen of India and other nationals in the context of the present economic system.

Even in 2011, Kurush Grant, Executive Director of ITC, recognized that "like all successful brands, India as a brand, too, should stand for being a great product in itself. Also, the country and its people have to understand what India symbolises" (Sarkar, 2011). But, if we

wish to answer the call to Make in India, we must ask: what is India's brand now? What impression is created in the minds of others when thinking of India today?

In this author's view, a negative impression of India has been created in the minds of foreigners because of perceptions of, for example, poor foreign policies, reports of dishonesty in political parties, unstable relations with neighbouring countries, corruption in the country's administration, and limited trade and cultural relations with the rest of the world (particularly China and fast-growing countries in the region). Even in this age of fast electronic communication and the Internet, where things have become so transparent and easily accessible to people across the globe, people from outside India have a hazy idea about India and its high income disparity, poor health and sanitation conditions, complex caste system, religious and communal conflicts, frenzied approaches of some groups.

India is a diverse country where people live at the greatest of extremes. Around 35 per cent of the urban population lives below the poverty line (SECC, 2015), and yet India is also an atomic power with high-end ballistic missiles and surgical strike capacity. India also has

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talented people in its information technology sector and many other Indians are working abroad in corporations such as Google, IBM, and Intel. At a projected rate of 7.5% and rising, India is the fastest growing economy in the world (Gil Sandar, 2015). It is indeed time to re-make India's brand.

This article elaborates on the image of India, as seen from the inside and outside, with the aim of understanding Brand India today and what brand-related challenges must be faced if the Make in India initiative is to be successful.

Understanding Brand India

Top better understand Brand India and to evaluate its chances for success, we considered the following nine factors, which we consider important based on our reading of the relevant literature:

1. *GDP share as share of the world economy:* At 6.83%, India ranked third among G20 countries in 2014 (Quandl, 2015).
2. *Growth rate of GDP:* As mentioned above, India is now the world's fastest growing economy (Gil Sandar, 2015). And its GDP growth since 2012 is further highlighted by declines in the other four BRICS countries (Brazil, Russia, China, and South Africa) over the same time period (World Bank, 2016). This growth in GDP is fueled by increasing contributions from services and industry relative to agriculture, which has fallen from over 50% of GDP composition in the early 1950s to less than 15% in the early 2010s (Planning Commission, 2014). This shift away from agriculture to services and industry is a sign of a developing economy.
3. *Investment destination:* In the ranking of most attractive destinations for investment, India is ranked first among global investors according to Ernst and Young's India Attractiveness Survey (Ernst and Young, 2015) and is ranked third (behind the United States and the United Kingdom, and just ahead of China and Germany) according to its Capital Confidence Barometer (Ernst and Young, 2016).
4. *Political system and stability:* Among its near neighbours, is considered relatively stable owing to the following factors: i) the absence of military coups in an independent democratic India; ii) its multi-party political system with a national and regional layer; iii) its strong and active judiciary system that has a degree of control over the country's functionary machinery; iv) its effective legal system with a degree of transparency; checks and balances on political system by non-governmental organizations (NGOs); and v) vigilant public participation in political activism.
5. *Corruption perception:* Despite all judiciary strength and peoples' active participation in political activism, corruption is common in India, which is ranked 76th among 168 countries in terms of perceived corruption (Transparency International, 2015). It seems that every day, Indians hear about new methods of corruption innovated by Indians. However, if there are silver linings to be found, they are that these revelations of corruption are possible only because there is now a system to control and prevent; that India ranks favourably among its nearest neighbours; and that its rankings are improving.
6. *Global presence of Indian corporates:* Indian companies are striving hard to make their presence globally and have had some significant achievements. However, there are no Indian companies among the top ten Global 500 companies, whereas China has three (Fortune, 2015). The highest-ranking Indian company is the Indian Oil Corporation (IOC) in the 109th position.
7. *Indians leading global corporations:* Indian workers have good reputations as hardworking, creative, disciplined, and loyal professionals. Accordingly, many large corporations such as Intel, Microsoft, IBM, BMW, Google, Motorola, MasterCard, SanDisk, Nokia, etc. hire talented Indians. In many cases, the global heads of multi-national corporations are of Indian origin (for examples, see Mishra, 2014).
8. *Peace index:* As per the Global Peace Index (Institute for Economics & Peace, 2015), India stands in the 143rd position, behind fellow BRICS countries Brazil (103rd), South Africa (136th), and China (124th), but ahead of Russia (153nd). There is much scope for improvement in this area.
9. *Black money:* In India, "black money" refers to funds earned on the black market, meaning that no taxes have been paid upon such earnings. India may be better in this area than other fast-developing countries, although this is another area where there is scope for improvement.

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Besides these nine key factors for projecting the brand image of India, there may many more factors to be considered, such as quality of governance and government effectiveness index, literacy rate and employability quality, adaptability quality, and acceptability.

Boosters to Brand India

A number of initiatives have been launched recently by the Government of India and non-governmental organizations that are likely to give a boost to efforts to develop a strong Brand India:

1. *Clean India Mission* (swachhbharat.mygov.in): Launched in October 2014, the ambitious "Swachh Bharat Abhiyan" (Clean India Mission) was undertaken to clean and maintain the cleanliness of the country's streets, roads, and rivers and to develop key hygiene infrastructure throughout the country, both to improve the attractiveness of the landscape and improve the health of the citizens.
 2. *Digital India* (digitalindia.gov.in): This vision of this flagship programme of the Government of India is "to transform India into a digitally empowered society and knowledge economy". The programme focuses on three key areas: i) digital infrastructure for every citizen, ii) governance and services on demand, and iii) digital empowerment of citizens.
 3. *Skill India* (skillindia.gov.in): Launched in July 2015, this initiative of the Government of India aims to train over 400 million people in India in different skills by 2022. The initiatives include the National Skill Development Mission, the National Policy for Skill Development and Entrepreneurship 2015, the Pradhan Mantri Kaushal Vikas Yojana (PMKVY) scheme, and the Skill Loan scheme.
 4. *Make in India* (makeinindia.com): Launched by the Government of India in September 2014, Make in India is designed to encourage multi-national, as well as national companies to manufacture their products in India.
 5. *Startup India* (startupindia.gov.in): This initiative aims at fostering entrepreneurship and promoting innovation by creating an ecosystem that is conducive for growth of startups. The objective is that India must become a nation of job creators instead of being a nation of job seekers. Startup India was launched in January 2016.
- In the author's view, an increased focus on the following other activities can also play a role in boosting the current and future Brand India:
1. *Foreign policy*: India's foreign policy is currently focused on improving relations with neighbouring countries in South Asia and on engaging the extended neighbourhood in Southeast Asia and the major global powers.
 2. *Foreign strategic alliances*: Recently, India has engaged in many joint military operations with, for example, China, France, Russia, Sri Lanka, and the United Kingdom .
 3. *Inviting foreign heads of state*: Among other visits, every year on January 26, India invites the head of state of a leading foreign country to be the chief guest at the Republic Day celebration. Recent guests have included the heads of the states from France, the United States, and Japan.
 4. *Global MoUs and business relations*: India is busy in signing important memorandums of understandings (MoUs) in the areas of trade, industry, and the service sector with important countries to encourage economic growth and development in India.
 5. *Resolving land issues with neighbours*: A long-pending land issue with Bangladesh was resolved with the efforts of Government of India last year. Such efforts are in full swing for resolving land issues with China, Pakistan, and Myanmar. It is a great image booster element for India in the eyes of foreign countries that India is able to resolve its important land issues with its neighbours in peaceful manner.
 6. *Strategic balance in strategic strength*: India is a nuclear power, having great capability to strike most of the countries in the region. This power gives strategic strength to India to maintain the power balance in the region.
 7. *United Nations influence*: India seeks a permanent seat in the security council of the United Nations, through which it could increase its global influence.
 8. *Special government attention on brand building*: Amongst the leading organizations working on building Brand India is India Brand Equity Foundation (IBEF; ibef.org), a public-private partnership between the Ministry of Commerce and Industry, the Govern-

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ment of India, and the Confederation of Indian Industry. It aims to effectively present the Indian business perspective and leverage business partnerships in a globalizing market-place. IBEF regularly tracks government announcements in policy, foreign investment, macroeconomic indicators, and business trends.

Challenges in Creating Brand India

Taking into account the backdrop of initiatives and activities described above, there is much work being done and many challenges to be overcome in building Brand India. And, like a global product, building a country's brand cannot be done overnight or without help. There has to be a comprehensive effort to be initiated from the government as well as from the entrepreneurs and corporate entities of a nation. Some of the key challenges that must be overcome by these groups are described below:

1. *Bureaucratic hassles*: India runs under basically the bureaucratic system established by the British almost one and a half centuries ago. Changes have been made, but many reforms are still needed to reduce the frequency and severity of bureaucratic "hassles". It has happened many times that large investors have pulled back from India due to intolerable delays in the project approvals from the authorities. To help improve Brand India, such hassles need to be reduced substantially. Key steps that need to be taken include adding accountability, incentives, transparency, and freedom in decision making, while removing subjectivity, political interventions, and vindictive approaches.
2. *Corruption*: Corruption is a very common word used in the Indian economy. As we have seen, India has to go a long way to bring down its corruption ranking at a global level. Scams and dishonest behaviour put India's image at stake.
3. *Work culture*: The work cultures of multinational corporations are often quite different than those typically found in India. Multinationals emphasize performance in an informal setting, with options for employees to work from home, for example, as long as output is maintained. Such practices are now becoming more common in the Indian IT sector, but the overall work culture in India tends to overemphasize physical attendance with not enough attention being paid to output. India needs to modernize its work culture to improve its global image.
4. *Quality control*: India needs to improve the quality of both exported and domestic goods and services. Quality control contributes to brand building through resource efficiency, increase standards of living, revenue generation, benchmarks, improved work environments, employee satisfaction, and improved moral values and standards. With exports in particular, India becomes better known through its products across the world. Therefore, Indian companies must ensure that international quality standards are being followed and that their products and services support a positive image of India.
5. *Flagship concept*: India has to take a lead in making and promoting its main products by industry and region. The flagship product concept may give India a big boost in terms of brand building. For example, Japan has a strong brand in technology. Germany is known for its expertise in the automobile sector. Israel is known for new agriculture technology. Similarly, India must decide upon and develop its areas of strength, and its overall brand, as Kurush Grant suggests in the opening quotation of this article.
6. *Technology adoption and implementation*: Indian managers need to be quick to adopt new technology in the primary sector, industry sector, and service sector. To build Brand India, India companies need to be seen as operating on the forefront of innovation and technology.
7. *Social and economic welfare*: Indian managers have to make sure that the brand building drive does come at the expense of their basic responsibility for social and economic welfare. Corporate social responsibility as a mandatory clause in some Indian companies has helped, but they need to think beyond this threshold of 2% of net profit. Indian companies have reserves and surpluses that can be used to contribute to the welfare of society.
8. *Research and development (R&D)*: India is considered to be a poor investor in R&D activities. The onus lies upon Indian companies and managers to invest in R&D, not only for their own direct benefit but to indirectly contribute to Brand India.

Conclusion

India has a great legacy and is considered to be one of the oldest economies in the world. In modern times, it can achieve distinction if Brand India is created well. Despite a number of strengths, in India, everything is

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not as per the aspirations of global business houses. Creating sustainable business environment and making India a production hub of the world is a challenging task. Bureaucracy, corruption, delays in clearance of business proposals, ethical standards and work culture, tax reforms, political interventions, socio-economic barriers, and regionalism are some of the challenges. Nonetheless, India is poised to take advantage of its strengths and overcome these challenges so that it can answer the call to Make in India and promote Brand India.

About the Authors

Alok Chakrawal is a Professor of Commerce and Business Administration, and the Coordinator of the Internal Quality Assurance Cell (IQAC) at Saurashtra University in Rajkot, India. He holds MCom and PhD degrees, for which he was awarded a Gold Medal upon graduation followed by a Junior Research Fellowship from the University Grants Commission. He is an accomplished international speaker and award-winning author of academic papers and books, particularly in the domain of stress management. He has been the General Manager and Director of SKSE Securities Ltd., Rajkot, and Controller of Examination of Saurashtra University. He also sits on various boards and committees at national and international levels.

Pratibha Goyal is Professor and Director of the School of Business Studies at Punjab Agricultural University in Ludhiana, India. She received her MBA from Guru Nanak Dev University in, Amritsar, India, and her PhD from Punjabi University in Patiala, India. She began her career as a Deputy Manager of Human Resources in a leading industry. Her immense love for mentoring young minds saw a shift in her career when she joined the faculty of Management in Punjabi University, Patiala, and later in Punjab Agricultural University, Ludhiana. She has been the Principal Investigator of three major research projects of the University Grants Commission and has participated in several national seminars, conferences, and symposia. She is on the Board of Directors of Hero Cycles Limited. She has authored five internationally acclaimed books, besides being Executive Editor of the *Effective Management* journal. She has published several notable research papers in national and international journals and has guided many scholars in their research projects.

References

- DIPP. 2016. Make in India: About Us. *Department of Industrial Policy & Promotion (DIPP), Ministry of Commerce, Government of India*. Accessed May 1, 2016: <http://www.makeinindia.com/about>
- Ernst and Young. 2015. *India Attractiveness Survey 2015: Ready, Set, Grow*. New Delhi: Ernst and Young India.
- Ernst and Young. 2016. *Global Capital Confidence Barometer*, 14th ed. London: Ernst and Young.
- Fortune. 2015. Global 500. *Fortune.com*. Accessed May 1, 2015: <http://fortune.com/global500/>
- Gil Sandar, F., Shome, S., Seth, S., & Misra, J. 2015. *India Development Update: Fiscal Policy for Equitable Growth*. Washington, DC: World Bank Group.
- Institute for Economics & Peace. 2015. *Global Peace Index 2015*. Sydney: Institute for Economics & Peace.
- Mishra, R. 2014. Top 10 Global Operations Head of India Origin. *India.com*. February 5, 2014. Accessed May 1, 2016: <http://www.india.com/top-n/top-10-global-operations-head-of-indian-origin-10763/>
- Planning Commission. 2014. Databook for Planning Commission. *Government of India Planning Commission*, December 22, 2014: http://planningcommission.nic.in/data/datatable/data_2312/DatabookDec2014%202.pdf
- Sarkar, A. 2011. Is India's Brand Image Still Limited in Global Perception? *afaqs!*: November 2, 2011. Accessed May 1, 2016: http://www.afaqs.com/news/story/32044_AdAsia-2011-Is-Indias-brand-image-still-limited-in-global-perception
- Transparency International. 2015. *Table of Results: Corruption Perceptions Index 2015*. Berlin: Transparency International. <http://www.transparency.org/cpi2015>
- Quandl. 2015. GDP as Share of World GDP at PPP By Country. *Quandl.com*. Accessed May 1, 2016: <https://www.quandl.com/collections/economics/gdp-as-share-of-world-gdp-at-ppp-by-country>
- World Bank. 2016. Data: GDP Growth (Annual %). *World Bank*. Accessed May 1, 2016: <http://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG/countries/1W-IN-CN-RU-ZA-BR?display=graph>

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Keywords: Brand India, Make in India, innovation, entrepreneurship, government initiatives, challenges, economic growth

Supporting Research-Inspired Entrepreneurial Activities in India

Nikhil A. Gokhale

*“ Cherish creativity, be bold, and have
the audacity to seek and discover.
Never lose your nerve!*”

Alan J. Heeger
Nobel Laureate in Chemistry (2000)

Nations built on innovation, entrepreneurship, and production are able to dominate the world economy. However, risk taking has traditionally been discouraged in developing nations. The uncertainty and financial insecurity associated with entrepreneurial activities are the greatest barriers that budding entrepreneurs need to overcome in order to transition into successful entrepreneurs. This challenge needs substantial effort and steady support from society. Easy access to information, mentorship, and a network of venture capitalists and angel investors also play critical roles in promoting entrepreneurial activities. To this end, the Government of India recently launched a nationwide campaign to promote entrepreneurial activities across the country. Some of the recently emerging trends indicate that scientific and technological innovators from India are now willing to be a part of the global entrepreneurial revolution. Research-inspired entrepreneurial initiatives are expected to play a key role in facilitating India's economic growth in the coming years. This article focuses on the initiatives undertaken by the Indian Government and by various academic institutes to facilitate entrepreneurial activities across the country.

Introduction

Entrepreneurship is defined as the ability to develop a business model in an attempt to find a creative solution to an existing problem, quite often using limited resources (Stevenson, 1983). Thus, entrepreneurs are path creators rather than path seekers, and they benefit from an ever-present sense of urgency (Bhide, 1994). The ability to take risks is an essential attribute seen in most entrepreneurs (MacKo & Tyszka, 2009), regardless of the area of expertise. Although most developed countries primarily focus on technology-driven entrepreneurial initiatives, many people in economically developing countries are essentially forced into less technologically focused forms of entrepreneurship as their only opportunity for self-employment (Singer et al., 2015). Recent trends, however, indicate that research-inspired entrepreneurial ventures (i.e., innovative business ideas that are the direct offshoots of scientific and technological breakthroughs) are on the rise in many developing and developed nations. Many universities from around the

world have recently started supporting incubation facilities and training cells for innovators who wish to become successful entrepreneurs (Pattnaik et al., 2014). Science- and technology-driven innovations are now being patented and commercialized by universities and research institutes from around the world (Hartmann, 2014). Researchers from developing countries such as India are now exploring new opportunities for commercializing their innovations.

This article provides an overview of the trend towards research-inspired entrepreneurship in India. It characterizes the India entrepreneur and outlines various governmental and academic initiatives to foster entrepreneurship in a culture that has traditionally been more focused on seeking steady employment than risk taking. It concludes with a mix of optimism and caution: if the challenges can be overcome and the opportunities can be taken, the scene is set for Indian entrepreneurs to redefine and reinvigorate the Indian economy.

Supporting Research-Inspired Entrepreneurial Activities in India

Nikhil A. Gokhale

Research-Inspired Entrepreneurship

Recent advances in science and technology have opened up new avenues for the commercialization of innovative products and services. The research community is increasingly becoming aware of the benefits of patent protection, licensing, and innovation-driven entrepreneurship. In India, budding researchers are increasingly publishing their work in reputable journals and seeking patent protection only for meaningful and commercially viable innovations. Funding agencies in India and abroad are now giving higher priority to innovations that can have a direct impact on the field, either through high-impact publications or through marketable patents. The ultimate goal is for research activities to make an impact on society – and not simply contribute to the vast number of patents and publications lying unnoticed in the ever-increasing database of global innovations.

On a related note, highly skilled Indian scientists and engineers educated in North American and European universities are increasingly returning to India because of a sudden increase in the demand for such researchers from government, academic, and industrial laboratories spread across the country. Many of the science and technology researchers, who previously preferred to remain confined inside their research laboratories, are now attempting to commercialize their inventions. Easy access to information, higher Internet speeds, and efficient business networking (Habiby & Coyle, 2010) have now made it possible for entrepreneurship-supporting communities to spread awareness about the importance of entrepreneurial ventures. Indian universities and national institutes have now started investing time and resources to motivate researchers to transform themselves into promising entrepreneurs. As an example, RK University in Rajkot, India, organized an International Conference on Research & Entrepreneurship in January 2016 (ICRE 2016; rku.ac.in/fdsr/icre/) to create a platform for researchers to interact with Indian and North American experts and entrepreneurs. Many distinguished researchers and entrepreneurs from India and abroad attended this event. Chemistry Nobel Laureate Dr. Alan J. Heeger (himself a technology entrepreneur) delivered a recorded keynote speech on the importance of research-inspired entrepreneurship. Similar initiatives and longer-term programs are also being increasingly undertaken by various other universities and institutes in India, examples of which will be provided in the section that follows.

The Indian Entrepreneur

Traditionally, most Indian families have encouraged their children to take up jobs in the government, academia, or industry. Risk taking and entrepreneurship have mostly been confined to certain geographical regions of India. The Indian state of Gujarat is aptly referred to as the land of entrepreneurship, because of the large number of entrepreneurs it has produced, including a large number of women entrepreneurs (Shastri & Rao, 2014). Over the years, the state has also exported thousands of entrepreneurs to a large number of countries around the world. The most popular entrepreneurial innovators in India include Narayana Murthy, the founder of Infosys (infosys.com), Kiran Mazumdar-Shaw, the founder of Biocon (biocon.com), and the co-founders of Flipkart (flipkart.com), Binny Bansal and Sachin Bansal. All of them had the right technical background to launch their companies. Several other technology-based companies in India were founded by people who did not have deep technical expertise in the related subject area. Varaprasad Reddy's Shantha Biotechnics (shanthabiotech.com), now owned by Sanofi (Frew et al., 2007), serves as an example of a small Indian research startup that obtained global recognition, after certain initial struggles. Shantha Biotechnics started as a research outfit in the Osmania University campus and was subsequently able to commercialize India's first low-cost (recombinant-DNA-based) Hepatitis-B vaccine (Chakma et al., 2011).

The technically competent Indian entrepreneur is increasingly receiving support from startup incubators spread across the country. Examples include:

1. The Centre for Innovation, Incubation, and Entrepreneurship (CIIE; ciie.co) at the Indian Institute of Management in Ahmedabad works in close collaboration with industry and with the Indian Government's Department of Science & Technology (DST; dst.gov.in) to actively catalyze the rapid commercialization of business ideas.
2. The Indian Institute of Technology Bombay's Society for Innovation & Entrepreneurship (SINE; sineiitb.org) provides support to technology-based innovations. Spread over an area of 10,000 square feet, SINE has also received support from the DST.
3. Venture Center (venturecenter.co.in), a initiative of the Council for Scientific & Industrial Research (CSIR;

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csir.res.in), predominantly focuses on the commercialization of technologies related to material science, chemical synthesis, biomedical research, and chemical engineering. The Venture Center receives support from the National Science & Technology Entrepreneurship Development Board (NSTEDB; nstedb.com), a body functioning under the aegis of the DST.

4. IIT Kharagpur's Science & Technology Entrepreneurship Park (STEP; step-iit.org) provides support to new ventures during their initial growth phase.
5. IIM Bangalore's Nadathur S. Raghavan Center for Entrepreneurial Learning (NSRCEL; nsrce.org) offers training to promising entrepreneurs.
6. The International Centre for Entrepreneurship & Technology (iCreate; icreate.org.in) in Gujarat provides incubation and guides entrepreneurs through mentorship, workshops, and seminars focused on building the entrepreneurial spirit and enabling the growth of existing companies.
7. The Indian Angel Network (indianangelnetwork.com) is a network of angel investors that provide funding, mentoring, and market access to early-stage ventures.
8. Khosla Ventures (khoslaventures.com) provides financial backing for solutions to large problems that are amenable to technology solutions.

Besides the examples listed above, a large number of other startup incubators have already been set up or are currently being set up across India and the number is expected to rise steadily in the next ten to fifteen years.

Government Initiatives for Indian Entrepreneurs

Under the leadership of Prime Minister Narendra Modi, the Government of India has recently launched several schemes for facilitating the establishment of entrepreneurial ventures across India. The "Make in India" (makeinindia.com) initiative aims to build an environment that is favourable to inventors, entrepreneurs, investors, and manufacturers. The initiative makes it significantly easier for product manufacturers to obtain industrial licenses, and the overall process has been streamlined to cater to the basic needs of the manufacturing industry. The government also has plans to build

"smart cities" in India's industrial corridors. Besides encouraging foreign direct investment, the government is also keeping funds aside for infrastructure development.

The Department of Electronics and Information Technology's (DeitY's) Technology Incubation and Development of Entrepreneurship (TIDE; tinyurl.com/zfbwg43) program is yet another example of how the government is trying to provide support to new technology business incubators and technology-driven entrepreneurship. Under the TIDE scheme, DeitY is facilitating product-oriented innovation, attempting to bridge the gap between research and commercialization, providing training to budding entrepreneurs, promoting the involvement of research faculty in startup businesses, and reinforcing the linkages between academia and industry. The TIDE centres have also been empowered to offer financial assistance for incubation and infrastructure improvement.

In January 2016, Prime Minister Modi officially launched the Startup India (startupindia.gov.in) campaign. The most prominent highlights of this pro-entrepreneurship campaign include simplified e-registration, self-certification, reduced patent application fees, fast-tracked patent applications for new India startups, an easy exit policy, financial support, income tax relaxation for the first three years, special benefits for female applicants, and pedagogical support for students. The Startup India campaign also puts special emphasis on innovation-driven entrepreneurial ventures. The campaign will also organize startup festivals to showcase India's research-inspired entrepreneurial initiatives and to connect entrepreneurial innovators with mentors, technology incubators, and investors. Research parks, startup centres, and technology business incubators will be set up across the country at premier institutes. Student innovators will benefit from a platform to showcase their work in order to secure adequate funding for their entrepreneurial innovation.

In summary, the Indian Government is enthusiastically supporting science- and technology-driven entrepreneurial initiatives and making it easier for budding researchers to transform themselves into successful entrepreneurs.

Conclusion

The traditionally job-seeking Indian research community is rapidly developing profound interest in commercializing their technology-driven innovations. The

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Indian Government is also investing significant resources into supporting entrepreneurship and is putting special emphasis on promoting research-inspired entrepreneurial initiatives. Indian and multinational companies have started showing great enthusiasm in supporting the Indian government's policies that would help India attain a more visible position on the global entrepreneurial map. The "Make in India" and "Startup India" programs have clearly outlined a detailed roadmap that would encourage researchers to turn their innovations into successful businesses.

Entrepreneurial innovators are now receiving the much-needed support required for overcoming the initial hesitation, uncertainty, and financial risks associated with startup ventures. A large cross-section of the Indian society has now started giving social recognition to budding technology entrepreneurs. Although the overall environment seems conducive to entrepreneurship, it remains to be seen whether the Indian innovators will try to make the most of every opportunity. India's budding scientists and engineers now need to focus their attention on originality and stay away from derivative work. India's innovators need to show a sense of urgency when it comes to launching science- and technology-driven entrepreneurial ventures. Merely proposing ground-breaking ideas is not enough.

On the positive side, several highly skilled researchers are returning to India to take up research positions in government, academic, and industrial laboratories. This rapid influx of highly skilled scientists and engineers is expected to give a boost to innovation (and possibly to entrepreneurship in the long run). Renowned universities and national institutes of repute spread across India are now establishing incubators to facilitate technology-driven startups. The Indian Government is also taking drastic measures to support research-inspired entrepreneurial initiatives. India is undergoing a dramatic transition and Indian innovators are attempting to catch up with the global leaders in the entrepreneurial sector by making use of their scientific and engineering skills. If the current trend continues, then the Indian economy is expected to reap the benefits of science- and technology-driven entrepreneurial initiatives in the coming years.

About the Author

Nikhil A. Gokhale is Associate Director of the Faculty of Doctoral Studies & Research at RK University in Rajkot, India. He obtained his Master's degree from the University of Pune, India, and moved to the United States to pursue his PhD in Chemistry (Biochemistry) at the University of Illinois at Chicago. He then joined the U.S. National Institutes of Health (NIH) as a Visiting Fellow to study the inositol phosphate-/pyrophosphate-based inhibition of proteins involved in cancer and inflammation. After conducting biomedical research at the NIH and at the University of Massachusetts Medical School, Dr. Gokhale returned to the University of Illinois at Chicago as a Visiting Research Assistant Professor. His research interests have focused on the field of biochemistry and signal transduction.

References

- Bhide, A. 1994. How Entrepreneurs Craft Strategies that Work. *Harvard Business Review*, 72(2): 150-161.
- Chakma, J., Masum, H., Perampaladas, K., Heys, J., & Singer, P. A. Indian Vaccine Innovation: The Case of Shantha Biotechnics. *Globalization and Health*, 7(9).
<http://dx.doi.org/10.1186/1744-8603-7-9>
- Frew, S. E., Rezaie, R., Sammut, S. M., Ray, M., Daar, A. S., & Singer, P. A. India's Health Biotech Sector at a Crossroads. *Nature Biotechnology*, 25(4): 403-417.
<http://dx.doi.org/10.1038/nbt0407-403>
- Habiby, A. S., & Coyle, D. M. 2010. The High-Intensity Entrepreneur. *Harvard Business Review*, 88(9): 74-78.
- Hartmann, D. 2014. Turning Technology into Business Using University Patents. *Technology Innovation Management Review*, 4(12): 37-43.
<http://timreview.ca/article/856>
- MacKo, A., & Tyszka, T. 2009. Entrepreneurship and Risk Taking. *Applied Psychology*, 58(3): 469-487.
<http://dx.doi.org/10.1111/j.1464-0597.2009.00402.x>
- Pattnaik, P. N., & Pandey, S. C. 2014. University Spinoffs: What, Why, and How? *Technology Innovation Management Review*, 4(12): 44-50.
<http://timreview.ca/article/857>

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Shastri, D., & Rao, U. T. 2014. Women Entrepreneurs of Gujarat. *Procedia Economics and Finance*, 11: 745–752.
[http://dx.doi.org/10.1016/S2212-5671\(14\)00238-X](http://dx.doi.org/10.1016/S2212-5671(14)00238-X)

Singer, S., Amorós, E., & Moska, D. 2015. *Global Entrepreneurship Monitor: 2014 Global Report*. London: Global Entrepreneurship Research Association.
<http://gemconsortium.org/report/49079>

Stevenson, H. H. 1983. *A Perspective on Entrepreneurship*. Harvard Business School Background Note 384-131. Boston, MA: Harvard Business School.

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<http://timreview.ca/article/986>

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Open Innovation in Indian Organizations: Types of Collaboration

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*“ Exploration is the engine that drives innovation.
Innovation drives economic growth. So let's go
exploring.”*

Edith Widder
Oceanographer and marine biologist
Co-Founder and CEO of ORCA

In order to succeed, it is important for any organization to leverage the power of the known and unknown networks around it. The organization must collaborate with others, and to do so requires it to open up its boundaries inside-out, outside-in, or both. However, the type of collaboration required to work with other parties and the respective output is different across different organizations on account of need, R&D intensity, capability, and risk-taking ability, as well as the nature of the business and industry. The major problem that comes in the way of open innovation in Indian organizations is their risk taking ability; the more an organization collaborates, the more risk it is taking by sharing internal information with the other parties. Through a sample of 31 manufacturing-based firms in India belonging to 12 different industries, the article explores the types of collaborations that they have with various related or unrelated organizations as they engage in open innovation. The article compares the collaborations each industry has entered into to identify the industries that are more open to take risks by collaborating with other parties in multiple ways.

Introduction

India is a social country where people love to embrace other cultures and mix with them, but they tend to shy away in situations where there is a risk of failure (Badani, 2011). Organizations operating in India similarly are hesitant to share knowledge with other firms. The reasons for this behaviour are manifold but include a risk-averse culture, fear of loss of intellectual property, bureaucracy, and formal organizational structures that separate the old and established organizations from the new generation of more informal and agile small organizations. Old and established corporations often find it difficult to compete with the small and medium-sized specialized organizations who have access to better technology and resources. It is because of a revolutionary growth of startups in India in the recent years, partly due to the present government and its initiatives such as "Startup India" (startupindia.gov.in), "Skill India" (skillindia.gov.in), and "Make in India" (makeinindia.com), and partly due to the availability of funds through venture capitalists.

Innovation has been a buzzword in India for quite some time. Large organizations have realized that the growth mantra is to collaborate with other firms either to share the costs of R&D or to co-create newer products or technologies with small and medium-sized specialized companies. Indian companies now realize that there are several capability gaps that can be addressed by opening up the organizational boundaries for collaboration with other firms. Firm-to-firm collaboration is also a good starting point for risk-averse organizations because it motivates them to take larger risks in innovation.

Globally, there is a rich literature base available on the benefits of open innovation (Chesbrough, 2003) and its various forms (Gassmann & Enkel, 2004), in addition to the pecuniary and non-pecuniary relationships among firms (Dahlander & Gann, 2010). However, there is very little literature available on open innovation in India. At most, there are magazine articles and news reports that mention specific multinational and global companies

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announcing their open innovation programs in India. Indian organisations are still working in their "silos" and, despite government initiatives, they shy away from opening up their organizations, mainly due to the weak intellectual property regime in India. They fear that, if they open up, their intellectual property would be at risk or that its protection would require expensive and time-consuming cases in international forums. For example, despite liberal norms of outward foreign direct investment (OFDI) of up to 400% of the net worth of an organization, Indian companies are reluctant to invest abroad because the top management does not want to take risks. However, any innovation program cannot be successful unless it has the support of the top management and there is a structure for it in place. Looking at the positive side of it, there are certain organizations (including several in the present study) that inadvertently had to follow global norms to reach global exposure and found it easy to open up their organizational boundaries. Some leaders of large corporate houses in India have also started investing individually in ideas that in turn can give them potential advantages beyond revenue.

The present research examines the steps Indian manufacturing companies in different industries have taken towards open innovation by mapping the various types of collaboration they followed from among the possible types of collaboration that are possible between two manufacturing-based organizations (Box 1). Among the classification systems for open innovation, there is a system developed by Dahlander and Gann (2010) in which a collaborative activity can be classified into one of four categories of open innovation: i) inbound acquiring, ii) inbound sourcing, iii) outbound revealing, or iv) outbound selling. This system was selected for this research because it captures the nature and direction (i.e., inside-out versus outside-in) of the open innovation activities and was developed based on manufacturing alliances. Manufacturing firms are R&D intensive and tend to require more resource-led collaboration with different parties compared to service-based firms. Also, the complexity of operations of manufacturing firms, intellectual property regimes, market needs, and maturity of the ancillary industries and supporting infrastructure varies significantly from country to country; therefore, the nature of collaborations are also different in manufacturing-based firms.

Based on this premise, we set out to examine the types of open innovation and forms of collaboration used by 31 manufacturing-based firms in India. The purpose was to understand which industries are more tolerant

Box 1. Possible types of collaboration in open innovation with manufacturing-based firms

- university-industry collaborations (UIC) (Balconi, 2004; Belderbos & Carree, 2004; Mansfield, 1996)
- collaboration with suppliers (Un et al., 2010)
- external acquisition of knowledge (Fey & Birkinshaw, 2005; Huang & Rice, 2009; Inauen & Schenker-Wicki, 2011)
- selling of a knowledge asset (Chiaroni et al., 2010)
- strategic alliances for technological activities (Belderbos et al., 2010)
- collaboration with government (Grimpe & Kaiser, 2010; Hwang & Lee, 2010; Laursen & Salter, 2006)
- licensing out and in (Tsai & Chang, 2008)
- inbound acquisition of firms/technology (Vanhaverbeke et al., 2002)
- external commercialisation of technology (Kutvonen, 2011)
- co-creation of patents (Lin et al., 2012)
- R&D alliance (Fey & Birkinshaw, 2005; Lin & Wu, 2010)
- manufacturing alliance (Dahlander & Gann, 2010; Faems et al., 2010; Suh & Kim, 2012).

to risk as compared to others as well as to present the types of collaboration of these firms with other firms in their internal and external network as an effort towards openness.

Methodology and Analysis

The sample represents the 31 manufacturing-based firms listed in the National Stock Exchange of India (NSE) under the index called the "Nifty Fifty"; the 19 non-manufacturing firms in the index were removed from the sample. The reason for selecting the sample from this index was that the resulting organizations were all: i) major companies in the manufacturing sector, ii) listed in the same stock exchange, and iii) large

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organizations having an average free-float market capitalization of INR 17,011.58 crores (approx. \$3.3 billion CAD as of April 2016).

For each of the 31 targeted firms, information about their collaborations was collected from: i) their annual reports for the year 2014–15, ii) information on their websites; and iii) data available at the national stock exchange. For open innovation, researchers have suggested a K-10 or 10-year data model to study the phenomenon in a particular company (Nadkarni & Narayanan, 2007); however, we determined that one year of data would be sufficient for our purposes because the objective was to identify the present state of collaboration and not to measure the impact or performance of open innovation initiatives of the targeted firms. The approach of selecting firms listed on a stock exchange and analyzing data based on their annual reports to study open innovation was also used by Mazzola and colleagues (2012).

Following Dahlander and Gann (2010), each firm's collaborative activities were classified into one of four categories of open innovation: i) inbound acquiring, ii) inbound sourcing, iii) outbound revealing, or iv) outbound selling. The findings and key insights for each category are described in the subsections that follow; Table 1 provides an overview of the categories of open innovation observed across the 12 industries.

1. Inbound acquiring

Among the 12 industries in the sample, nine were self-sufficient in their R&D. Only three industries –automobiles, paints, and pharmaceuticals – and precisely, only one company each from each industry, followed the inbound acquisition route for collaboration. In these three industries, the primary purpose of such collaborations was to gain access to proprietary technology that would benefit the acquiring company and effectively block the entry of other players into the market.

Key insights for each industry were as follows:

- *Automobiles and automobile components:* Only one transnational automobile components firm continuously looks outwards to acquire new technologies and companies. The other five go through a collaborative route, such as a joint venture or strategic alliance.
- *Paints:* The sampled company from this industry has a technology council at the senior management level that continuously looks for new technologies and companies from any part of the world.

- *Pharmaceuticals:* One company out of the four pharmaceutical companies in the sample was involved in buying-in a majority stake in a precision pharmaceutical company (a leading respiratory device manufacturer) to become self-reliant through backward integration.

2. Inbound sourcing

Thirty out of 31 firms were engaged in an activity related to the sourcing of external knowledge, although the types differed across various industries. The key features were large conglomerates that had or wanted to have a dedicated facility or firm looking after the transfer of inbound and outbound knowledge. Some were so particular about it that they had a board-level committee to take such decisions. The activities and actions (or planned actions) suggested that almost every firm realized that they need to collaborate with the external world, but that it might just be limited to sourcing external knowledge for the time being.

Key insights for each industry were as follows:

- *Automobiles and components:* Six companies in the list deploy various forms of collaboration with suppliers, including global R&D centres that are open to automotive alliances as well as suppliers. Through such collaborations, one company experienced a 100% increase in the number of patents they filed. There are also clear mechanisms for idea generation from within the organization as well as from the suppliers. Three firms aspired to have world-class centres for R&D and global innovation, out of which two have already achieved it and the third one is going to establish it in the United Kingdom by 2017.
- *Oil and gas:* There are three public sector and one private sector organizations in this group. Except for one public sector organization, which has yet to open up internally, the remaining three have specific programs to exploit external knowledge through alliances, joint ventures for upstream technologies, and programs to enable employees to go beyond their job descriptions and try something new and innovative. They bring in the research expertise of universities involved in all kinds of hydrocarbons research.
- *Pharmaceuticals:* Out of four companies in the list, all except one are globally active. Two collaborate in various ways through subsidiaries or joint ventures in different countries, while the third one has established itself as a specialty pharmaceutical company and conducts various "reach out" activities only in that partic-

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Table 1. Categories of open innovation observed across 12 industries representing the 31 sampled Indian firms

Industry (Number of firms)	Outside-In Open Innovation		Inside-Out Open Innovation	
	Inbound Acquiring	Inbound Sourcing	Outbound Revealing	Outbound Selling
Automobiles and components (6)	<ul style="list-style-type: none"> • Technology buy-in • Company buy-in 	<ul style="list-style-type: none"> • Technological know-how arrangements • Joint ventures with suppliers • Open R&D centres • Collaboration with auto alliances • Idea contests for staff 	<ul style="list-style-type: none"> • Research projects for universities • Immersion programs • Co-creation with academic partners 	
Oil and gas (4)		<ul style="list-style-type: none"> • Joint ventures • Global alliances for technology 	<ul style="list-style-type: none"> • Industry–academia partnership • Opening facilities for entrepreneurs 	
Pharmaceuticals (4)	<ul style="list-style-type: none"> • Majority stake buy-in 	<ul style="list-style-type: none"> • Collaboration for special purposes with other global players • Specialized subsidiaries in various countries 	<ul style="list-style-type: none"> • Innovation centres in universities 	
Cement (3)		<ul style="list-style-type: none"> • Technology sourcing by paying a license fee • Partnership with local bodies • Partnerships with non-governmental organizations • Partnerships with other institutions 		
Power (3)		<ul style="list-style-type: none"> • Joint ventures • Collaboration through holding companies • Partnership with local bodies and governments 		
Steel (3)		<ul style="list-style-type: none"> • An independent business unit to take care of innovation activities for all the group companies 	<ul style="list-style-type: none"> • Industry–academia partnership 	<ul style="list-style-type: none"> • Providing turnkey solutions for establishing steel plants

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Table 1 (cont.). Categories of open innovation observed across 12 industries representing the 31 sampled Indian firms

Industry (Number of firms)	Outside-In Open Innovation		Inside-Out Open Innovation	
	Inbound Acquiring	Inbound Sourcing	Outbound Revealing	Outbound Selling
Fast-moving consumer goods (2)		<ul style="list-style-type: none"> • Co-creation with suppliers • Co-creation with customers • Innovation networks • Collaboration with stakeholders such as municipalities and governments • Open innovation teams 		
Mining and minerals (2)		<ul style="list-style-type: none"> • Joint ventures • Technical collaboration • Co-discovery mechanisms 		
Heavy electricals (1)			<ul style="list-style-type: none"> • Co-creation with competitors 	<ul style="list-style-type: none"> • Sale of turnkey expertise to other companies
Heavy machinery (1)		<ul style="list-style-type: none"> • Common group company to look after innovation • Technical and cross-functional collaboration with Indian corporations • Technical and cross-functional collaboration with foreign corporations 		
Paints (1)	<ul style="list-style-type: none"> • Technology buy-in • Company buy-in 	<ul style="list-style-type: none"> • Joint ventures for testing and commercialization • Sourcing of technology 		
Textiles (1)		<ul style="list-style-type: none"> • Multidisciplinary teams for collaboration with other parties 		

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- ular domain. The two companies having subsidiaries and joint ventures abroad have seen a continuous rise in the R&D intensity through their full-fledged R&D centres and now are well known companies in the global pharmaceutical industry.
- *Cement*: Out of three companies in this group, one was paying a licensing fee to another company for technological know-how. The other two had a number of innovative products and their expenditures on R&D were going up in absolute terms while R&D intensity was coming down.
 - *Power*: Being a regulatory industry, all three firms in this group entered into legal collaborative agreements with all partners whether through the joint venture route in India or outside, or they collaborated through their holding companies. Although they enter into such agreements for innovation, they often end up conducting activities relating to improving operational efficiency rather than focused specifically on innovation.
 - *Steel*: Out of three companies in this group, one already has a dedicated company looking after multidisciplinary team association, new product and technology development, and innovation. The second company is going to establish a large innovation centre in the United Kingdom that will institutionalize innovation and give it a systematic push even though a number of innovations have already generated a revenue stream for the organization. The third company has an innovation task force and a technology innovation advisory committee at the top management level that helps institutionalize innovation by showing commitment of the management and takes care of all related inbound and outbound processes.
 - *Fast-moving consumer goods*: There are two companies in this group: one is national and the other is multinational. Both of them interact with end users frequently – much more often than any other industry in this study. Though both of them have programs to collaborate with their partners, the multinational has established innovation networks at the country level and has initiated the process of open innovation by establishing a dedicated teams in its R&D departments. The national company has identified a niche in life sciences technology and has developed a collaborative network with various regulatory stakeholders so that they are able to launch new products, but the major emphasis is on sales.
 - *Mining and minerals*: There are two companies in this group and both belong to the public sector. One is active in all kinds of joint ventures and Indian and foreign collaborations for exploration and technology including with organizations in the United States, the European Union, and Australia. The other company has limited scope in terms of operations; they have confined themselves to India only and do not appear to be seeking any collaboration or knowledge transfer.
 - *Heavy machinery*: The only company represented in the list from this industry leverages a lead group company that has the responsibility to guide and look after innovation efforts by various group companies, including this one. The primary focus is on technology-led innovation. It collaborates with various companies, essentially under technical collaboration or partnership.
 - *Paints*: The only company listed in the index belonging to this industry is quite active in terms of joint ventures and collaboration. They are able to test new products and technologies in one country and commercialize them in another country. Their R&D intensity as well as R&D expenditure is also continuously going up.
 - *Textiles*: Part of a large diversified group, the company has a lead sister concern that looks after innovation and collaboration activities for the group, including this company. The company has formed multidisciplinary teams for in-house innovation and to look for outside opportunities.
- ### 3. Outbound revealing
- Evidence of outbound revealing was limited to industries that require a high degree of coordination among the upstream and downstream business partners. This included automobiles, heavy electricals, oil and gas, pharmaceuticals, and steel. These all were large integrated firms where cost cutting or possessing proprietary knowledge was a major concern. The indicators of openness in such firms are industry-academia partnerships and co-creation initiatives. However, the purpose of collaborating with other organizations varied across industries. In industries such as steel and automobiles, the purpose was to cut product-development costs, whereas in an industry such as pharmaceuticals, collaboration was based on a specific technology that would give the companies a strategic advantage. The firms here were also not very much interested in licensing out their technologies.

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Key insights for each industry were as follows:

- *Automobiles and components*: Three out of six firms in this industry do not have any significant revelation for the outside world; the remaining three are quite open to industry–academia partnerships. These latter three companies work together with universities and open their labs and R&D departments along with suppliers for developing innovative products.
- *Oil and gas*: Three out of four firms in the industry engage in industry–academia partnerships with the leading universities such as Indian Institutes of Technology. The only private firm among these three allows entrepreneurs to join their global innovation forum for mutual benefits.
- *Pharmaceuticals*: Only one company has established innovation centres in universities outside India for developing innovative products.
- *Steel*: Only one firm out of three provides industry–academia partnership by opening up their facilities for faculty and students.
- *Heavy electricals*: The one firm in this industry works in tandem with its competitors (although not directly) to co-create new products and create win-win situations.

4. Outbound selling

In this category, only two companies – one company belonging to heavy electricals industry and one belonging to the steel industry – were selling their capabilities to outside parties. Both firms were outbound selling through their subsidiaries as a new revenue stream, spinning it out and earning revenue that helps in writing off the expenditure in R&D. They might have started sharing knowledge with other firms much earlier and formed these subsidiaries once the volume of this inside-out knowledge transfer became large.

Key insights for each industry were as follows:

- *Steel*: Of the three steel firms in the index, the largest is an integrated steel manufacturer that provides turnkey solutions to establish small specialized steel plants through a different subsidiary. This subsidiary provides manufacturing knowledge consultancy services to other companies.
- *Heavy electricals*: The only company representing this industry in the index provides turnkey expertise to other companies and earns revenue. Although some evid-

ence was found for outbound selling to competitors and suppliers, such activities are accomplished by a different subsidiary of the same group and not by the company that is part of this sample.

Discussion

The Indian manufacturing-based firms in this study follow inbound sourcing as the primary method to go open and collaborate with other firms in their networks. Thereafter, they reach out to academia and engaged through outbound revealing. The inbound acquiring of capabilities or technology and outbound selling come later. From the pace of growth of these four activities of open innovation, it can be concluded that a majority of Indian firms are following an outside-in type of open innovation as per their requirement. They understand the need to reach out to related and unrelated partners to bridge the gaps in their technology or capabilities or to develop new ones. However, few companies in this study have gone into the revealing mode. Companies that are markets leaders, have expertise in a domain or technology expertise, are in capital-intensive industries, have a global experience curve have started adopting the revelation mode or inviting outsiders for development of products with or for them.

If we rank the industries based on the number of types of collaboration in the overall category of outside-in innovation, we see that automobiles and components, paints, and fast-moving consumer goods occupy the first, second, and third place, respectively. These industries primarily serve consumer markets, and may therefore be more inclined to seek input from outsiders, including consumers. These three industries use a greater variety of collaboration forms to reach out and gain vital inputs in term of technology and capabilities for developing new products. Barring heavy electricals, all industries selected in the sample show evidence of collaboration of different types for outside-in innovation. On the other hand, inside-out innovation, which generally comes after a company has gained the advantages of outside-in innovation, is more common in automobiles and components, oil and gas, steel, heavy electricals, pharmaceuticals, and mining and minerals. Therefore, these industries can be considered more open than the others in the sense that they make use of their internal and external network of partners. The industries where inside-out is still absent are cement, fast-moving consumer goods, heavy machinery, paints, power, and textiles. Companies in these industries may still be protective and reluctant to share capabilities

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and resources with the outside world. Although the government has provided incentives to openness including generous limits of outward foreign direct investment, they may still be reluctant to take risks in this way. One reason might be a tendency towards closed organizational cultures in these industries, although further study is required to understand the motivations of the firms in this study to open up or remain closed.

Conclusion

The research gives an idea about the types of open innovation used in large firms in India, which is a fast-growing emerging market. The limited types of collaboration at both the extremes of inbound acquiring and outbound selling shows that the manufacturing-based firms are cautious before taking a plunge into an acquisition or selling out a wing as the returns from such a move might not be immediate and, at the same time, the risk is high. The types of collaboration that are existing in various industries give pointers to various firms trying to do business in India or partner with Indian firms. It is also observed that firms that have global operations or global markets for their products tend to be more open through their subsidiaries if not through their parent organization based in India. A company is able to cushion the risk and exposure to intellectual property rights issues by putting only one arm forward in the form of a subsidiary located in a foreign country. It also gives an indication of the need for them to open up and the types of collaborations they are making with other parties.

The nature of business prompts companies to be more open, as seen in the multitude of suppliers required in the automobile industry or in industries requiring long gestation and large investment projects, as seen in the oil and gas industry. Chain reactions were also visible: if one company establishes a dedicated innovation centre in any part of the world, other companies in the same industry are motivated to take more risks in opening up their boundaries for other firms by way of collaborations. They appear to feel a bit more secure if the acid test has already been taken by the first company.

This research adds to the literature on how emerging market firms adopt open innovation, when due to will and when due to compulsion. It also presents a comparative evaluation of various industries, revealing which of them are more open as compared to others, which forms of collaboration are common across certain industries, and which forms of collaborations are still unique to a particular industry.

Future studies should consider the age and stage of the firm in the local market and their effects on a firm's open innovation ambition. Similarly, it would help to compare open innovation practices between emerging market firms and emerged or developed market firms. By using age, size, geographical spread, nature, and complexity of the firm as control variables, a statistical analysis can be done to study unique types of open innovation used by these firms. Similarly, reasons may be explored as to why some companies are more open in an industry and why others are not.

About the Author

Shiv S. Tripathi is an Assistant Professor of Strategic Management at the Management Development Institute in Gurgaon, India. He holds a PhD degree from Vinod Gupta School of Management at the Indian Institute of Technology, Kharagpur. He has published papers in the area of product and service innovations, growth strategies, and innovations in large organizations. He has presented papers at national and international conferences organized by the Indian Institutes of Management, Indian Schools of Business, and the Strategic Management Society. His current research interests include open innovation, ambidexterity, and innovation in emerging markets. He is a member of the Academy of Management, the International Society of Professional Innovation Management, and the Strategic Management Society. He is presently writing a book on innovation strategy.

References

- Badani, J. 2011. Open Innovation in India: Are Indian Companies Ready for Open Innovation? *Tech Monitor*, July–August: 60–61.
- Balconi, M. 2004. Networks of Inventors and the Role of Academia: An Exploration of Italian Patent Data. *Research Policy*, 33(1): 127–145. [http://dx.doi.org/10.1016/S0048-7333\(03\)00108-2](http://dx.doi.org/10.1016/S0048-7333(03)00108-2)
- Balderbos, R., & Carree, M. 2004. *Cooperative R&D and Firm Performance*. Paper presented at the DRUID Summer Conference, Copenhagen, June 14–16, 2004.
- Balderbos, R., Faems, D., Leten, B., & Van Looy, B. 2010. Technological Activities and Their Impact on the Financial Performance of the Firm: Exploitation and Exploration within and between Firms. *Journal of Product Innovation Management*, 27(6): 869–882. <http://dx.doi.org/10.1111/j.1540-5885.2010.00757.x>

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- Chesbrough, H. 2003. *Open Innovation: The New Imperative of Creating and Profiting from Technology*. Boston, MA: Harvard Business School Press.
- Chiaroni, D., Chisea, V., & Frattini, F. 2010. Un-Ravelling the Process from Closed to Open Innovation: Evidence from Mature, Asset-Intensive Industries. *R&D Management*, 40(3): 222–245. <http://dx.doi.org/10.1111/j.1467-9310.2010.00589.x>
- Dahlander, L., & Gann, D. M. 2010. How Open Is Innovation? *Research Policy*, 39(6): 699–709. <http://dx.doi.org/10.1016/j.respol.2010.01.013>
- Faems, D., de Visser, M. Andries, P., & Van Looy, B. 2010. Technology Alliance Portfolios and Financial Performance: Value-Enhancing and Cost-Increasing Effects of Open Innovation. *Journal of Product Innovation Management*, 27(6): 785–796. <http://dx.doi.org/10.1111/j.1540-5885.2010.00752.x>
- Fey, C., & Birkinshaw, J. 2005. External Sources of Knowledge, Governance Mode and R&D Performance. *Journal of Management*, 31(4): 597–621. <http://dx.doi.org/10.1177/0149206304272346>
- Gassmann, O., & Enkel, E. 2004. *Toward a Theory of Open Innovation: Three Core Process Archetypes*. Paper presented at the R&D Management Conference, Lisbon, July 6, 2004.
- Grimpe, C., & Kaiser, U. 2010. Balancing Internal and External Knowledge Acquisition: The Gains and Pains from R&D Outsourcing. *Journal of Management Studies*, 47(8): 1483–1509. <http://dx.doi.org/10.1111/j.1467-6486.2010.00946.x>
- Huang, F., & Rice, J. 2009. The Role of Absorptive Capacity in Facilitating "Open Innovation" Outcomes: A Study of Australian SMEs in the Manufacturing Sector. *International Journal of Innovation Management*, 13(2): 201–220. <http://dx.doi.org/10.1142/S1363919609002261>
- Hwang, J., & Lee, Y. 2010. External Knowledge Search, Innovative Performance and Productivity in the Korean ICT Sector. *Telecommunication Policy*, 34(10): 562–571. <http://dx.doi.org/10.1016/j.telpol.2010.04.004>
- Inauen, M., & Schenker-Wicki, A. 2011. The Impact of Outside-In Open Innovation on Open Innovation Performance. *European Journal of Innovation Management*, 14(4): 496–520. <http://dx.doi.org/10.1108/14601061111174934>
- Kutvonen, A. 2011. Strategic Application of Outbound Open Innovation. *European Journal of Innovation Management*, 14(4): 460–474. <http://dx.doi.org/10.1108/14601061111174916>
- Laursen, K., & Salter, A. 2006. Open for Innovation: The Role of Openness in Explaining Innovation Performance among U.K. Manufacturing Firms. *Strategic Management Journal*, 27(2): 131–150. <http://dx.doi.org/10.1002/smj.507>
- Lin, B.-W., & Wu, C. H. 2010. How Does Knowledge Depth Moderate the Performance of Internal and External Knowledge Sourcing Strategies? *Technovation*, 30(11/12): 582–589. <http://dx.doi.org/10.1016/j.technovation.2010.07.001>
- Lin, C., Wu, Y.-J., Chang, C., Wang, W., & Lee, C.-Y. 2012. The Alliance Innovation Performance of R&D Alliances: The Absorptive Capacity Perspective. *Technovation*, 32(5): 282–292. <http://dx.doi.org/10.1016/j.technovation.2012.01.004>
- Mansfield, E. 1996. The Modern University: Contributor to Industrial Innovation and Recipient of Industrial R&D Support. *Research Policy*, 25(7): 1047–1058. [http://dx.doi.org/10.1016/S0048-7333\(96\)00893-1](http://dx.doi.org/10.1016/S0048-7333(96)00893-1)
- Mazzola, E., Manfredi, B., & Giovanni, P. 2012. *The Effect of Inbound, Outbound and Coupled Innovation on Performance*. Paper presented at the XXIII ISPIIM Innovation Conference, Barcelona, Spain, June 17–20, 2012.
- Nadkarni, S., & Narayanan, V.K. 2007. Strategic Schemas, Strategic Flexibility and Firm Performance: The Moderating Role of Industry Clockspeed. *Strategic Management Journal*, 28: 243–270. <http://dx.doi.org/10.1002/smj.576>
- Suh, Y., & Kim, M.-S. 2012. Effects of SME Collaboration on R&D in the Service Sector in Open Innovation. *Innovation: Management, Policy & Practice*, 14(3): 349–362. <http://dx.doi.org/10.5172/impp.2012.14.3.349>
- Tsai, K.-H., & Chang, H.-C. 2008. The Contingent Value of Inward Technology Licensing on the Performance of Small High-Technology Firms. *Emerging Markets Finance and Trade*, 44(4): 88–98. <http://dx.doi.org/10.2753/REE1540-496X440407>
- Un, C. A., Cuervo-Cazurra, A., & Asakawa, K. 2010. R&D Collaborations and Product Innovation. *Journal of Product Innovation Management*, 27(5): 673–689. <http://dx.doi.org/10.1111/j.1540-5885.2010.00744.x>
- Vanhaverbeke, W., Duysters, G., & Noorderhaven, N. 2002. External Technology Sourcing through Alliances or Acquisitions: An Analysis of the Application-Specific Integrated Circuits Industry. *Organization Science*, 13(6): 714–733. <http://dx.doi.org/10.1287/orsc.13.6.714.496>

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Keywords: India, open innovation, collaboration, forms, types, manufacturing, risk

Q&A

Dharmesh Raval

Q. *What is the Role of Higher Education Institutions in Promoting Entrepreneurship in India?*

A. Encouraging entrepreneurs to start new businesses is a priority for any government and is only increasing in importance as nations look to grow, become self-reliant, and overcome economic uncertainty. These are multi-dimensional objectives that can be fulfilled by promoting entrepreneurship in any economy, but in India, they take on added significance because of the size and age of the population. India's total population of 1.3 billion people ranks second only to China, and with 28% of those people aged 10 to 24 (28%), the country has 367 million young people that are either at the start of their careers or soon will be (UNFPA, 2015). Hence, it is the national interest to provide education, support, and facilities that can help guide this large and young segment of the population towards careers in entrepreneurship and to help them build and grow their businesses.

As hubs of youth populations and providers of education, educational institutions are well suited to delivering both training and opportunities to students and encouraging young people to pursue entrepreneurship as a career. The opportunity is timely, in part because many students are still unclear about the future course of their careers, but also because entrepreneurial intentions tend to decrease with age (Badal & Srinivasan, 2011.). As emphasized in the GALLUP-HOPE Index, this contexts means "it is that much more important to nurture and engage student's entrepreneurial spirit early so they are prepared to start a business or invent something that changes the world" (GALLUP, 2013).

Thus, in India, the role of higher education institutions is undergoing a fundamental change to better encourage and support young entrepreneurs. Traditionally, students in higher education institutions were exposed to that was limited to their specific domain. For example, students of engineering and technology received technology-based education and learned about common technology-focused practices, with training limited to the domain-specific skills required by industry. However, such training is not suffi-

cient for pursuing entrepreneurship. Unless domain knowledge is accompanied with knowledge and hands-on experience in the world of business, it is difficult for educational institutions to create large cohorts of entrepreneurs that will succeed in the long run.

Business schools are well suited to providing exposure to entrepreneurship given that business and related aspects are part of the curriculum. Such educational institutions must showcase their ability to enhance the major scientific and technical competences required by their students to be competitive in the future. And today's business environments demand proactiveness and an entrepreneurial spirit, even among their employees (Santos et al., 2012).

Key factors in entrepreneurial success such as motivation and willingness to take risk are difficult to implant in students in a classroom environment; however, higher education institutions can provide education in business and the processes relating to starting and running a business enterprise, as well as case studies of real-life entrepreneurs, both successful and unsuccessful. Entrepreneurship education must provide both the theoretical aspects of entrepreneurship and the necessary business skills. Students must understand that being an entrepreneur requires a different attitude than being an employee: an entrepreneur must be a visionary while also have the ability to design and implement appropriate strategies to keep the organization performing and growing. Students who wish to become entrepreneurs must also understand the important role of innovation, not only for commercialization but also for improvements in business performance.

Such learning is indeed important, but it can be difficult to assess the long-term outcomes within the contexts and timeframes of entrepreneurship courses and programs, the true test of which will be undertaken in the real world. So, beyond the classroom, higher education institutions in India also seek to play a critical role in developing an entrepreneurship ecosystem that can boost the number of sustainable startups in the coun-

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try. This ecosystem approach includes networking with industry experts for knowledge sharing and mentoring students, and the use of physical resources including the educational institution's research facilities, etc. Educational institutions are also working with industry bodies to create internships and research-related placement for their students; such relationships and arrangements can be extended and utilized to mentor young entrepreneurs in relevant business skills. Ecosystems also support a higher education institution's role in creating and disseminating knowledge of new technologies, including gathering insights about their commercial application.

Incubation and mentorship

One way to connect higher education institutions with an entrepreneurship ecosystem and provide real-world training to entrepreneurs is for an institution to run an incubator in the sense of a shared facility where a combination of training, mentoring, and infrastructural facilities are offered "under one roof". Incubation is relatively a new activity within higher education institutions in India, but it has grown with the support of the National Science & Technology Entrepreneurship Development Board (NSTEDB; nstedb.com), whose mandate is "to help promote knowledge-driven and technology-intensive enterprises" and "convert 'job-seekers' into 'job-generators'". India has more than 65 technology business incubators, 15 science and technology entrepreneurs parks (STEPs), 38 entrepreneurship development cells, and 35 innovation and entrepreneurship development centres actively working and supported by the central government (DST, 2016). These are the major government supported initiatives, most of which are run by private and government educational institutions in the area of entrepreneurship development.

Through incubators, higher education institutions in India can provide student entrepreneurs with infrastructure and facilities essential to launching and running their startups, including classroom arrangements, science laboratories, computer facilities, technicians, reference reading materials, and subscriptions to internationally reputed research journals. Teachers also make key contributions, both in facilitating learning and instilling confidence in students about their ability to start businesses and providing mentorship. As observed by the Danish Agency for Science, Technology and Innovation (DASTI, 2016) when examining entrepreneurship activities at Indian higher education institutions, "greater emphasis has been laid down in the recent past on benefits of entrepreneurial-focused edu-

cation at the universities, instilling the confidence in students to turn ideas into reality. These could be in the form of structured mentorship programmes, short courses or other forms of training."

Mentorship is indeed vital, particularly for acquiring knowledge of technical domains and business skills. Institutions can connect students to industry leaders and alumni as mentors, in addition to matching students with appropriate faculty mentors. There is also a recent trend across India for faculty members to collaborate directly with students to create joint startups (DASTI, 2016).

Challenges

Despite the recent trend for higher education institutions in India to provide support to student entrepreneurs, there remain several challenges to overcome, some of which are social and some of which are institutional. At a social level, Indian students are accustomed to being "job seekers", and the allure of a predictable monthly income (and the need to repay student loans) discourages them from considering entrepreneurship as a potential career (DASTI, 2016). At an institutional level, offering students support and guidance in creating startups is a relatively a new model for higher education institutions in India. Despite growth in this area, India's entrepreneurial ecosystem is still in an early stage and the number of higher education institutions offering programs in entrepreneurship and incubator facilities remains limited (EY & FICCI, 2014), especially given the size of India's population. And having a new program in place to teach entrepreneurship does not necessarily translate into better outcomes in the short-term (e.g., Sharma, 2015). It will take time for higher-education institutions to develop the required capabilities to provide consistently high-quality entrepreneurship education across the country.

These and other challenges must be overcome if India's Central Government is to realize its ambitious plans to promote entrepreneurship for quick economic development of the country, and higher education institutions are set to play a key role in those plans. Through the National Policy on Skill Development and Entrepreneurship (MSDE, 2015), the government is relying heavily on higher education institutions to roll out programs and schemes for promoting entrepreneurship in the country. Also, the Finance Ministry is investing in venture capitalist funds to meet the equity requirements of startups and has set up an India Aspiration Fund to support the entrepreneurial ecosystem.

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Conclusion

Entrepreneurship education and incubation (including mentoring) are the key areas in which higher education institutions can contribute directly to the quantity and quality of new startups and indirectly to the Indian economy. Entrepreneurship education through these institutions can help in increasing awareness of entrepreneurship as a viable career option and the support received through incubation can help student entrepreneurs overcome hurdles to starting and growing their businesses. In this way, the role of higher education institutions in India goes beyond just teaching and awarding degrees to more broadly influencing the economic development of the country.

About the Author

Dharmesh Raval is Dean of the Faculty of Management and Professor and Director of the School of Management at RK University in Rajkot, India. His teaching and research interests include entrepreneurship, financial performance measurement and analysis, and related areas. He has presented research papers at several national and international conferences and has authored articles in reputed journals. He received his PhD from Saurashtra University in Rajkot. His academic experience includes over 15 years of teaching, research, academic-administration, and industry-academia interface experience in the areas of business management and commerce. He has been on the boards of Rajkot Commodity Exchange (Government of India) in Rajkot and Rajkot Management Association (AIMA) in past. His interests include designing new academic courses and engaging in business-support activities for startups.

References

- Badal, S. B., & Srinivasan, R. 2011. Mentor Support Key to Starting a Business. *GALLUP*: November 25, 2011. Accessed May 1, 2016: <http://www.gallup.com/poll/150974/Mentor-Support-Key-Starting-Business.aspx>
- DASTI. 2016. *Entrepreneurship and Start-Up Activities at Indian Higher Education Institutions*. Copenhagen: Danish Agency for Science, Technology and Innovation (DASTI). <http://icdk.um.dk/en/news/newsdisplaypage/~/media/icdk/Documents/Copenhagen/microsoft-word-india-analyse-docx.pdf>
- DST. 2016. Technology Business Incubators. *Department of Science & Technology (DST)*. Accessed May 1, 2016: <http://www.nstedb.com/institutional/tbi-center.htm>
- EY & FICCI. 2014. *Higher Education in India: Moving Towards Global Relevance and Competitiveness*. Kolkata and New Delhi: Ernst & Young (EY) and the Federation of Indian Chambers of Commerce and Industry (FICCI). [http://www.ey.com/Publication/vwLUAssets/EY_-_Higher_education_in_India/\\$FILE/EY-higher-education-in-india.pdf](http://www.ey.com/Publication/vwLUAssets/EY_-_Higher_education_in_India/$FILE/EY-higher-education-in-india.pdf)
- GALLUP. 2013. *The 2013 GALLUP-HOPE Index*. New York: GALLUP and Operation Hope. <https://www.operationhope.org/images/uploads/Files/2013galluphopereport.pdf>
- MSDE, 2015. *National Policy on Skill Development and Entrepreneurship 2015*. New Delhi: Ministry of Skill Development and Entrepreneurship (MSDE). <http://www.skilldevelopment.gov.in/National-Policy-2015.html>
- Santos, P., Guedes, A., & Fonseca, M. 2012. The Role of Teaching Institutions to Prepare and Promote Social Entrepreneurs. *ACRN Journal of Entrepreneurship Perspectives*, 1(1): 161–167.
- Sharma, L. 2015. A Review of the Role of HEI's in Developing Academic Entrepreneurship: An Evaluative Study of Uttarakhand State, India. *Journal of Entrepreneurship in Emerging Economies*, 7(2): 168–188. <http://dx.doi.org/10.1108/JEEE-06-2014-0022>
- UNFPA. 2015. *State of the World Population 2015*. New York: United Nations Population Fund (UNFPA). http://www.unfpa.org/sites/default/files/pub-pdf/State_of_World_Population_2015_EN.pdf

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Keywords: entrepreneurship education, incubation, mentoring, higher education institutions, HEI, startups

TIM Lecture Series

An Introduction to Intellectual Property for Entrepreneurs

Elizabeth Collinson

“Knowledge about intellectual property helps companies develop strategies and make informed decisions to achieve their business objectives.”

Elizabeth Collinson
Project Officer
Canadian Intellectual Property Office

Overview

The TIM Lecture Series is offered by the Technology Innovation Management (TIM; timprogram.ca) program at Carleton University in Ottawa, Canada. The lectures provide a forum to promote the transfer of knowledge between university research to technology company executives and entrepreneurs as well as research and development personnel. Readers are encouraged to share related insights or provide feedback on the presentation or the TIM Lecture Series, including recommendations of future speakers.

The fourth TIM lecture of 2016 was held at Carleton University on April 21st and was presented by Elizabeth Collinson, Project Officer in the Outreach Program of the Canadian Intellectual Property Office (CIPO; cipoc.gc.ca). The lecture provided an introduction to intellectual property with a particular emphasis on its relevance to entrepreneurs in Canada.

Summary

Intellectual property refers to “creations of the mind, such as inventions; literary and artistic works; designs; and symbols, names and images used in commerce” (WIPO, 2016). With this lecture, Collinson sought to raise awareness of intellectual property among entrepreneurs and highlight the resources available to help use intellectual property strategically to achieve business aims.

She emphasized that intellectual property does not refer to an “idea”, but is rather about protecting the tan-

gible outcomes of an idea, which can be protected just as an organization can protect physical forms of property. Although patents frequently receive the most attention, Collinson emphasized that protecting other forms of intellectual property (Table 1) may also be important, depending on a company's situation and objectives:

1. *Trade secret*: refers to any confidential information used in a business that provides a competitive edge and that is kept secret. Protection of a trade secret lasts until it is disclosed, at which point it loses its value. It is also vulnerable to novel rediscovery by others (which does not constitute infringement) and reverse engineering. Keeping a trade secret confidential is the responsibility of the intellectual property owner who should restrict access to key information about a trade secret, consider splitting aspects of the information among trusted staff members, and keep detailed records of who has been told what and when.
2. *Patent*: in Canada, a patent provides the owner exclusive rights to make, use, or sell their invention (i.e., a product, composition, machine, or process) for 20 years from the date of filing provided that the invention is novel, useful, and non-obvious. The owner must provide a full public disclosure of the invention, therefore entrepreneurs should carefully consider the timing of this intellectual property mechanism in light of their business objectives so that they can maximize their returns during the period of exclusivity.

TIM Lecture Series – An Introduction to Intellectual Property for Entrepreneurs

Elizabeth Collinson

Table 1. Protection of intellectual property (IP) in Canada

Form of IP	Protects	Application Required?	Term
Trade secret	Confidential information	n/a	Indefinite
Patent	Invention	Yes	Up to 20 years from filing date
Trademark	Words, logos, slogans, sounds	Recommended	15 years (renewable)
Copyright	Writing, music, art, plays, etc.	Recommended	Typically life plus 50 years, but varies
Industrial design	Visual feature	Yes	Up to 10 years

3. *Trademark*: refers to words, a word and a design, a design, or a shape, slogan, sound, or certification mark that is tied to the goods or service in the context in which the mark is being used. Registration of a trademark is not required in Canada, but it can be used as evidence of its use and context for legal purposes and provides national coverage because it applies beyond the region where the mark is known.
4. *Copyright*: protects the author of original works, including literary, dramatic, visual, artistic works, and certain other intellectual works (including computer code). The protection is automatic, but registration may provide additional benefits.
5. *Industrial design*: refers to a product's visual features of shape, configuration, pattern, or ornament. To be registered, a design must be new and original; it must be sufficiently distinct to the extent that it does not resemble an existing registered design; and it must not affect the functionality of the manufactured article.

Collinson encourages entrepreneurs to learn more about intellectual property early in their business adventure in order to understand how they may use intellectual property strategically to help meet their business objectives.

In Canada, the Canadian Intellectual Property Office (CIPO; Box 1) provides services and resources to entrepreneurs, including access to client service centres, business development officers, databases, and case studies. Collinson concluded the lecture by demonstrating the importance of early consideration of intellectual property through one of the CIPO's video case studies, which are available at: tinyurl.com/jkp25sw

Box 1. The Canadian Intellectual Property Office (CIPO; cipo.gc.ca)

In Canada, the administration and processing of intellectual property is primarily the responsibility of the Canadian Intellectual Property Office (CIPO), an agency within the governmental department Innovation, Science and Economic Development Canada (formerly Industry Canada) (ic.gc.ca). CIPO's mission is "to contribute to Canada's innovation and economic success by:

- providing greater certainty in the marketplace through high-quality and timely intellectual property rights
- fostering and supporting invention and creativity through knowledge sharing
- raising awareness to encourage innovators to better exploit intellectual property
- helping business compete globally through international cooperation and the promotion of Canada's intellectual property interests
- administering Canada's intellectual property system and office efficiently and effectively"

In 2014–2015, received applications for more than 37,000 patents, 52,000 trademarks, 7,000 copyrights, and 5,000 industrial designs and handled nearly 30,000 requests for patent examinations (CIPO, 2016).

TIM Lecture Series – An Introduction to Intellectual Property for Entrepreneurs

Elizabeth Collinson

About the Speaker

Elizabeth Collinson is a Project Officer in the Outreach Program of the Canadian Intellectual Property Office (CIPO), where she has worked for more than 20 years in the Trademarks Branch, the Copyright and Industrial Design Branch, and the Information Branch. She has held various roles including Examiner, Policy and Training Officer, Supervisor, Business Development Officer, Project Officer and she was successful in acquiring Trademark Agent status. Currently, Elizabeth works in an Outreach team promoting the awareness and further education of intellectual property.

This report was written by Chris McPhee.

References

CIPO. 2016. *Canadian Intellectual Property Office Annual Report 2014–2015*. Ottawa: Innovation, Science and Economic Development Canada.

WIPO. 2016. What is Intellectual Property? *World Intellectual Property Organization (WIPO)*. Accessed May 1, 2016: <http://www.wipo.int/about-ip/en/>

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Keywords: intellectual property, patents, trade secrets, trademarks, copyright, industrial design, startups, entrepreneurship, Canada, CIPO

Author Guidelines

These guidelines should assist in the process of translating your expertise into a focused article that adds to the knowledge resources available through the *Technology Innovation Management Review*. Prior to writing an article, we recommend that you contact the Editor to discuss your article topic, the author guidelines, upcoming editorial themes, and the submission process: timreview.ca/contact

Topic

Start by asking yourself:

- Does my research or experience provide any new insights or perspectives?
- Do I often find myself having to explain this topic when I meet people as they are unaware of its relevance?
- Do I believe that I could have saved myself time, money, and frustration if someone had explained to me the issues surrounding this topic?
- Am I constantly correcting misconceptions regarding this topic?
- Am I considered to be an expert in this field? For example, do I present my research or experience at conferences?

If your answer is "yes" to any of these questions, your topic is likely of interest to readers of the TIM Review.

When writing your article, keep the following points in mind:

- Emphasize the practical application of your insights or research.
- Thoroughly examine the topic; don't leave the reader wishing for more.
- Know your central theme and stick to it.
- Demonstrate your depth of understanding for the topic, and that you have considered its benefits, possible outcomes, and applicability.
- Write in a formal, analytical style. Third-person voice is recommended; first-person voice may also be acceptable depending on the perspective of your article.

Format

1. Use an article template: **.doc .odt**
2. Indicate if your submission has been previously published elsewhere. This is to ensure that we don't infringe upon another publisher's copyright policy.
3. Do not send articles shorter than 1500 words or longer than 3000 words.
4. Begin with a thought-provoking quotation that matches the spirit of the article. Research the source of your quotation in order to provide proper attribution.
5. Include a 2-3 paragraph abstract that provides the key messages you will be presenting in the article.
6. Provide a 2-3 paragraph conclusion that summarizes the article's main points and leaves the reader with the most important messages.
7. Include a 75-150 word biography.
8. List the references at the end of the article.
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