

Capability Building and Innovation in the Offshore IT Services Industry in India

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ABSTRACT

Capability building and innovation provide the foundation for strategy implementation and superior performance. The global connected economy offers MNEs the opportunity to leverage their knowledge, capabilities, and innovations in foreign markets. It also challenges them to acquire new capabilities and new innovations from their own efforts, from multiple geographies, and from multiple sources. Multinational enterprises from the developed world have been offshoring IT services to emerging markets since the early 2000s. What is relatively new is that, during the last 5-10 years, they have also been offshoring their core innovation and R&D functions to emerging markets – to their captive centers and to third-party vendors there. After discussing how MNEs build capabilities and how they innovate, the paper presents a detailed case study of capability building and innovation in India's offshore IT services industry. The study is based on in-depth, personal interviews with about 20 senior and top-level executives of 15 leading Indian IT services firms and their foreign clients. Each of the interviews lasted one-and-a-half to two hours or more and was conducted onsite at the companies' premises in India, China, and the United States.

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“We read, ask questions, explore, go to lectures, compare notes and findings, consult experts, daydream, brainstorm, formulate and test hypotheses, build models and simulations, communicate what we’re learning, and practice new skills.”

- Bill Gates

INTRODUCTION

Capability building and innovation provide the foundation for strategy implementation and superior performance. The global connected economy¹ offers multinational enterprises (MNEs) the opportunity to leverage their knowledge, capabilities, and innovations in foreign markets. It also challenges them to acquire new capabilities and new innovations from their own efforts, from multiple geographies, and from multiple sources, including customers, suppliers, subsidiaries, partners, competitors, universities, governments, trade bodies, and so on. They need all that and more to compete and grow in the hypercompetitive connected economy.

This paper is about the strategies companies are adopting (should adopt) to meet the dual challenges of innovation and disruption of global value chains.

Innovation. Survey after survey has highlighted the importance of capability building and innovation to performance in MNEs of all kinds. For instance, half of the 1,448 executives surveyed by McKinsey & Company in May 2014 ranked capability building as a top-three priority on their firms’ strategic agendas. As shown in Table 1, it is an even more significant priority among firms in India and China, with 62 percent and 58 percent ranking capability as a top priority, respectively (Bensorn-Aarmer, Otto, & Webster, 2015).

Table 1: Percent of Respondents Rating Capability Building as a Top-Three Priority

Country/Region	Where Capability Building Falls on Organizations’ Strategic Agendas			Total # Respondents
	Top Priority	Top 3 Priority	Total	
Total	8%	42%	50%	1,448
India	13	49	62	115
China	6	52	58	73
Europe	9	42	51	461
North America	9	40	49	428
Asia-Pacific	6	43	49	186
Developing Markets	6	41	47	184

Source: Adapted from McKinsey & Company, “Building Capabilities for Performance,” McKinsey & Company, January 2015

Based on a 2015 survey of 250 C-suite executives of companies from the G7, Hult researchers found “speeding up innovation” to be the highest-ranked priority among all their strategic priorities. And, 63 percent of the executives surveyed rated the “need for creativity and innovation” as very significant in their organizations (Hult CEO Global Trends Report, 2015).

Firms like Apple, Google, and Coca-Cola have unique sets of resources and capabilities that have made them hugely successful in their home market, and which they have also successfully leveraged in many foreign markets. They continue to build capabilities through in-house research and development (R&D), mergers and acquisitions (M&A), and strategic alliances to remain at the forefront in their markets. Google, in particular, has made over 180 acquisitions (and numerous alliances) during its lifetime to strengthen its resources, capabilities, and market position in fields as diverse as online advertising, search, security, robotics, and artificial intelligence. Dozens of the 180 acquisitions Google has made were foreign acquisitions.²

Disruption of global value chains. The disruption of global value chains is being caused by globalization and technological developments, a process started decades ago but which has been gaining greater currency in recent time periods. A value chain helps us understand how a firm disaggregates its important activities with a view to identifying its sources of competitive advantage. A global company, compared to a purely domestic company, can spread parts of its value chain to different countries to develop and accentuate its competitive advantage (Porter, 2008). As we show later in the paper, innovation and R&D, which had traditionally been the mainstay of MNEs’ home-based activities, are now being increasingly performed in many host markets – caused by the growing vertical de-integration of firms and the arrival of many emerging markets and major players from those markets on to the global arena able to take up work, even core engineering and R&D work, from companies in advanced countries.

CAPABILITY BUILDING

Companies build capabilities through their own efforts or acquire them through M&A and alliances. Sometimes, companies also acquire capabilities through imitation or by copying other companies’ capabilities.

Building Capabilities through Own Efforts

A capability consists of one or more organizational *routines*. A routine is a coordinated pattern of activities involving a sequence of actions undertaken by certain individuals within an organization (Nelson & Winter, 1982). Thus, a routine is essentially a standard operating procedure (SOP). For instance, brand building, lean manufacturing, customer service, and post-merger integration (PMI) are all capabilities, each requiring several routines, or several SOPs. Organizations develop capabilities through trial-and-error, experimentation, and research and development, and they refine and standardize their routines over time through practice or learning-by-doing. CEMEX of Mexico is well-known for its PMI capability, honed over decades of M&A experience. CEMEX’s PMI capability includes routines such as training of the integration team through cultural awareness and team-building workshops, cost reduction in energy usage, inventory rationalization, operations streamlining, and implementation of its satellite communication system, CEMEXNet, at the acquired companies, among other routines.

HBO (Home Box Office Inc.) is a U.S.-based pay-television network, owned by Time Warner Inc., offering basic and premium television service available to about 127 million subscribers in some 150 countries worldwide. People subscribe to HBO through their television service provider, which costs them about \$15 a month. The subscription-television market is estimated to be at \$236 billion by 2018. This, along with the rapid rise of its competitor Netflix, encouraged HBO to offer a stand-alone, video-on-demand service of its own that did not require a subscription to the HBO channels. In particular, HBO was interested in reaching out to the 70 million U.S. households that had cable service but no HBO subscription. HBO's preparation for offering its streaming service meant developing streaming capability, which it decided to develop on its own. In 2011, HBO hired Otto Berkes from Microsoft to develop the streaming technology, to be called HBO Now. Berkes, a long-time Microsoft employee and industry legend, had been responsible for co-creating the Xbox and had developed a tablet prototype long before the iPad appeared on the market. Berkes's goal was to develop and deliver the streaming technology by late 2016 by upgrading "HBO Go" service, a forerunner to HBO Now. This was a highly complex assignment and was to take a very long time. However, when HBO leadership could not wait to launch their streaming service that long, it decided to outsource streaming-capability development to the technology arm of Major League Baseball, MLB Advanced Media. MLB Advanced Media successfully streams baseball games live to its millions of subscribers throughout the U.S. and also has other media clients, including Sony, ESPN, and World Wrestling Entertainment. HBO Now was officially unveiled at Apple's "Spring Forward" event in San Francisco on March 9, 2015, and launched on April 7, 2015 with a \$14.99 per month subscription.³ (Berkes resigned his position at HBO shortly after the outsourcing arrangement was announced.)

Acquiring Capabilities through M&A and Alliances

AMEC Foster Wheeler PLC is a British engineering services and project management company that made several acquisitions over the last three decades to expand its engineering capabilities and geographic footprint. In 2014, for instance, AMEC acquired Foster Wheeler of Switzerland for \$3.2 billion, which turned out to be a "transformational" acquisition for the company. It provided AMEC with capabilities and capacity downstream in both oil and petrochemical industries, complementing its upstream capabilities, as well as the potential of achieving double-digit growth in earnings.⁴ HBO, in the example discussed above, tried to develop the needed capabilities through their own efforts, but when that was not successful, they acquired the streaming-technology capability through an outsourcing alliance. Companies make mergers, acquisitions, and alliances when they are seeking resources and capabilities they lack (and for other reasons, such as quicker access to the market, to broaden their product line, etc.)

INNOVATION

Innovation involves creating something significantly new, better, and of value.⁵ The "something significantly new" can be a product, service, process, design, business concept, business model, or even a new feature in an existing product or service. Innovation is often incremental, but can also be disruptive, breakthrough, or transformational for a company. It can arise from anywhere inside a company, from its innovation ecosystem that extends to individuals and entities outside the company, and increasingly, from sources beyond its ecosystem.

Innovation Trends

Multinationals from developed countries have lately been investing in R&D and innovation in emerging markets. PricewaterhouseCooper's (PwC's) strategy consulting arm, Strategy&, has been conducting the *Global Innovation 1000* study of the top 1000 public corporations worldwide that spend the most on R&D. The 2015 study found that the geographic footprint of innovation has expanded dramatically in the years since 2008, with R&D in China and India, for example, growing by 120 percent and 115 percent, respectively (Table 2). These changes reflect major regional shifts, as more and more MNEs locate their R&D and innovation efforts abroad in search of talent and high-growth markets (Jaruzelski, Schwarts, & Staack, 2015).

According to the study's authors, "An overwhelming 94 percent of the world's largest innovators now conduct elements of their R&D programs abroad... These companies are shifting their innovation investment to countries in which their sales and manufacturing are growing fastest, and where they can access the right technical talent. Not surprisingly, innovation spending has boomed in China and India since our 2008 study... Collectively, in fact, more R&D is now conducted in Asia than in North America or Europe (Jaruzelski et al, 2015: 2)." Further, companies that disperse their R&D globally perform as well as, or better than, companies with a focused R&D footprint.

Table 2: Global Shifts in R&D Spending, 2007-2015

Country	In-country R&D Spending (US\$ Bn)		
	2007	2015	% Change
United States	109	145	33%
Japan	40	50	25
Germany	28	32	14
China	25	55	120
U.K.	23	22	- 4
France	20	16	- 20
India	13	28	115
Canada	9	10	11
Italy	8	11	38
South Korea	7	13	86
Israel	7	11	57

Source: 2015 Global Innovation 1000 Study, p. 5

Table 3 shows the top 20 companies that spend the most on R&D. The top 5 sectors with the most R&D spending in the 2015 study were: Computing and Electronics (24.5 percent of total R&D expenditure by the 1000 companies); Healthcare (21.3 percent); Automotive (16.1 percent); Software and Internet (11.2 percent); and Industrials (11.1 percent). From a regional perspective, companies headquartered in North

America, Europe, and Japan dominate the Global Innovation 1000. As a percent of annual revenue, healthcare companies spend the most on R&D, and automotive companies the least.

Table 3: The Top 20 R&D Spenders, 2015

2015 Rank	2014 Rank	Company	2015 R&D Spend (\$Bn)	% of Revenue	Headquarters	Industry
1	1	Volkswagen	\$15.3 Bn	5.7%	Europe	Automotive
2	2	Samsung	\$14.1	7.2	South Korea	Computing and Electronics
3	3	Intel	\$11.5	20.6	United States	Computing and Electronics
4	4	Microsoft	\$11.4	13.1	United States	Software and Internet
5	5	Roche	\$10.8	20.8	Europe	Healthcare
6	9	Google	\$9.8	14.9	United States	Software and Internet
7	14	Amazon	\$9.3	10.4	United States	Software and Internet
8	7	Toyota	\$9.2	3.7	Japan	Automotive
9	6	Novartis	\$9.1	17.3	Europe	Healthcare
10	8	Johnson & Johnson	\$8.5	11.4	United States	Healthcare
11	13	Pfizer	\$8.4	16.9	United States	Healthcare
12	12	Daimler	\$7.6	4.4	Europe	Automotive
13	11	General Motors	\$7.4	4.7	United States	Automotive
14	10	Merck	\$7.2	17.0	United States	Healthcare
15	15	Ford	\$6.9	4.8	United States	Automotive
16	16	Sanofi	\$6.4	14.1	Europe	Healthcare
17	20	Cisco Systems	\$6.3	13.4	United States	Computing and Electronics
18	32	Apple	\$6.0	3.3	United States	Computing and Electronics
19	19	GlaxoSmithKline	\$5.7	15.0	Europe	Healthcare
20	28	AstraZeneca	\$5.6	21.4	Europe	Healthcare
Average 20 Total			\$8.1 Bn	8.4%		

Source: Adapted from the 2015 Global Innovation 1000 Study, p. 6

Note: Companies shown in red have been among the top 20 R&D spenders every year since 2005

The study also identified the ten most innovative companies based on the study participants' responses (Table 4). Apple, Google, Samsung, 3M, GE, Microsoft, and IBM have shown up on the list of the top 10 most innovative companies every year since 2008. Astra joined the Top 20 list for the first time in 2015,

and Toyota rejoined the list in 2015 after a two-year hiatus. For the sixth year running, no pharmaceutical company made the list of the top 10 innovative companies, even though they generally spend the most as a percent of their annual revenues on R&D. (The ranking is based on survey responses.) It is interesting to note that the top R&D spenders are not necessarily the most innovative companies, a result PwC has consistently found since 2008. Furthermore, the ten most innovative companies outperformed the ten biggest R&D spenders on revenue growth, in terms of EBITDA as a percentage of revenue, and market-cap growth.

What is behind the globalization of innovation and R&D

As more and more MNEs locate their R&D away from their corporate headquarters, what is behind this phenomenon? A number of factors and trends underlie the globalization of R&D and innovation.⁶

- Decentralization of “big science,” such as the Genome project, and the increasing complexity and cross-disciplinary nature of frontier science and technology.
- Spread of science and technology around the world through cross-border M&A, technology alliances, and increased mobility of scientists and inventors across institutional and national boundaries.
- Advances in information and communication technologies and significant reductions in transportation, communication, and logistics costs.
- Changes in trade and investment regimes (GATT and WTO) over the last seventy years and the signing of the WTO’s Trade Related Intellectual Property Rights (TRIPS) Agreement have encouraged companies to locate their R&D operations in emerging markets.
- Increasing harmonization of technical and regulatory standards, leading to internationally accepted product specifications and business process protocols.
- High wage differentials between developed and developing countries for scientific and technical personnel, shortage of such personnel in developed countries, and their increasing availability in developing countries.
- Growing capabilities of emerging market firms for taking on higher and higher level innovation and R&D work in many fields.
- Need for MNEs to be close to their customers so that they can offer customized products and services to them.

Table 4: The 10 Most Innovative Companies

2015 Rank	2014 Rank	Company	Geography	Industry	R&D Spend (\$Bn)
1	1	Apple	United States	Computing and Electronics	6.0
2	2	Google	United States	Software and Internet	9.8
3	5	Tesla Motors	United States	Automotive	0.5
4	4	Samsung	South Korea	Computing and Electronics	14.1
5	3	Amazon	United States	Software and Internet	9.3
6	6	3M	United States	Industrials	1.8
7	7	General Electric	United States	Industrials	4.2
8	8	Microsoft	United States	Software and Internet	11.4
9	9	IBM	United States	Computing and Electronics	5.4
10	N/A	Toyota	Japan	Automotive	9.2

Source: Adapted from the 2015 Global Innovation 1000 Study, p. 9

Note: Companies in red have been among the 10 most innovative companies every year since 2010

How to Innovate

Firms can innovate using a Build|Buy|Ally framework (Figure 1): they can do so through internal development (Build), through M&A (Buy), and through partnerships (Ally). Irrespective of the method used, having an effective innovation system requires an organizational structure that supports innovation, an absence of the NIH (“Not Invented Here”) syndrome, and an appropriate benchmarking and control system. Additionally, according to a 2012 McKinsey & Company global survey, for a company to be successful at innovation, it is vitally important that it has an innovation strategy and that the innovation strategy is well integrated with its corporate strategy (Capozzi, Kelle, & Somers, 2012). The Build|Buy|Ally framework for creating innovation is presented below (see Figure 1).

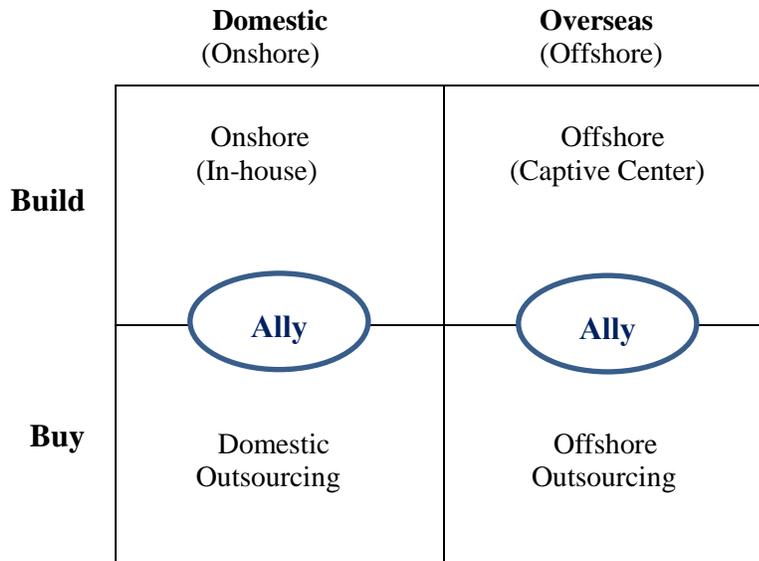
Innovation through Internal Development (Build)

MNEs have employed some of the following structural approaches for creating innovation through their own efforts: R&D or innovation corporate functions, new-business development functions, global innovation centers, emerging-business-opportunity groups, emerging-technology business groups, advanced-technology institutes, and in-house incubators and accelerators. Such efforts are good for innovation, but can also lead to dispersed teams of researchers, unconnected with each other – unless effective integration and control mechanisms are in place.

Wolters Kluwer, a Netherlands-based multi-billion dollar publishing and information services company that operates in over 150 countries and has grown largely through M&A, runs an internal R&D program

called Innovation Labs. It helps the company experiment with new ideas and refine them before investing in the process of full product development and launch (Segarra, 2013).

Figure 1: A Basic Model for Acquiring Innovations and Innovation Capabilities



Source: Vinod K. Jain & S. Raghunath, “Strengthening America’s International Competitiveness through Innovation and Global Value Chains.” In Ben L. Kedia & Subhash C. Jain, Eds., *Restoring America’s Global Competitiveness through Innovation*, Cheltenham, U.K.: Edward Elgar, 2013, p. 257.

Some companies set up their own incubators or accelerators, in addition to R&D units, to innovate from within. An in-house incubator allows highly creative and motivated employees to work on specific projects in which they or the company might be interested. Many companies, including Microsoft and Google, have in-house incubators. For instance, “The Garage” at Microsoft serves as an in-house incubator for employees to work on projects about which they are passionate. It is an “an internal community of engineers, designers, hardware tinkerers and others from all different parts of the company who work on their own or with others on pet projects, some of which could potentially benefit the company.” Under Microsoft’s new CEO, Satya Nadella, the Garage is being extended to include customers who can provide quick feedback on lightweight, single-scenario apps developed for them. (Such incubators are to be distinguished from company-owned incubators/accelerators that provide venture-capital funding to seasoned entrepreneurs and founders from outside the company. An example is the Samsung Accelerator, with locations in San Francisco, California, and New York City.⁷

Acquiring Innovation through M&A (Buy)

Acquiring innovations through M&A, rather than doing innovation organically, is a common method used by MNEs. Sometimes such acquisitions are opportunistic, but often an MNE waits for someone else to innovate and build a business around the innovation, and then attempts to acquire the whole company. Building innovation capability through M&A is undertaken by companies entering a new market, as well as by companies wanting to strengthen their existing products and innovation capabilities. For instance, Apple introduced iTunes in 2001, which was based on the SoftJam MP technology developed by Casady

& Greene, a company Apple had acquired the previous year; SoftJam MP was an early Mac Operating System-compatible MP3 player. Apple’s iTunes, and its iPod introduced in 2003, eventually disrupted the digital music industry. IBM made several acquisitions to support its new Information on Demand business-intelligence service launched in February 2006. As part of this initiative, IBM acquired Cognos from Canada in 2007, as well as many other companies to support this new line of business.⁸ Other examples of companies entering new lines of business through the acquisition of companies and innovation capabilities include Facebook’s acquisition of Instagram and WhatsApp, and Google’s acquisition of Android.

Large pharmaceutical companies routinely acquire or invest in smaller biotechnology companies working on or with new and novel drugs (see also “corporate venture capital” below). For instance, the Bristol-Myers Squibb Company of the U.S. paid \$105 million to ZymoGenetics Inc., also of the U.S., in January 2009 for its phase I drug for Hepatitis C. In June 2010, Bayer AG of Germany paid \$40 million to OncoMed Pharmaceuticals Inc. of the U.S. for access to its experimental anti-cancer drug, which had yet to enter Phase I human trials at the time of the investment. Both deals provide for further investments by the pharmaceutical companies if the drugs are successful in subsequent testing and development, as well as royalties on eventual sales (Douglas, 2010).

Major companies are also increasingly acquiring other technology-focused companies in new and evolving domains such as social, mobile, analytics, and cloud (SMAC) technologies, driving business innovation. Table 5 offers some well-known (and some not so well-known) examples of these and other innovation-inspired acquisitions. The examples show that the acquirers are not only from IT, telecom, or pharmaceutical industries, but also from companies whose competitive advantage derives from the use of technology in their operations.

Table 5: Examples of Innovation- and Technology-Inspired Acquisitions

Acquirer	Target	Industry	Technology
Verizon	Terremark	Telecommunications	Cloud Computing
Google	Boston Dynamics	Internet	Robotics
VMware	Nicira	IT	Mobility/Cloud
Apple	Siri	IT	Mobility/Cloud
Home Depot	Black Locus	Retail	Cloud Computing
Walmart	OneOps	Retail	Cloud Computing
Monsanto	Climate Corp	Agriculture	Big Data Analytics
Novo Nordisk	Xellia	Pharmaceuticals	Drug Discovery
Intuit	Check	Financial Services	Mobility
Siemens	eMeter	Energy	Smart Grid
Nokia	Desti	Mobility Services	Mobile Applications
Avis	Zipcar	Transportation	Sharing Economy

Source: Evangelos Simoudis, “Re-Imagining Corporate Innovation with a Silicon Valley Perspective,” The Corporate Innovation Blog, July 7, 2014. Adapted from <http://corporate-innovation.co/2014/07/07/acquiring-innovation/>.

Acquiring Innovation through Alliances (Ally)

An increasingly popular approach, innovation through alliances, can take many forms, such as innovation through joint ventures, licensing, technology alliances, leveraging the firm’s innovation ecosystem consisting of individuals and groups outside the organization, setting up a corporate venture capital (CVC) unit, and open innovation. Alliances can be a source of innovations that a firm is unable to achieve on its own or unable to acquire through M&A. Many innovations, especially those involving frontier science and technology, require collaboration among multiple partners with complementary capabilities, which any one of them is unable to undertake on his own. Partnering with others on an R&D project enables a firm to expand its innovation capabilities and outcomes, while sharing the cost and risk of getting into new technologies and new markets. However, like in any relationship, conflicts may arise when the alliance partners’ values and objectives are not aligned to their common end goals, or due to contractual issues.

A few other examples of innovation alliances follow.

Innovation ecosystems. Some large firms, like Google and Cisco Systems, have created innovation ecosystems, which are platforms to encourage collaboration between individuals from within the firm and individuals from their extended enterprise. The Google Innovation Ecosystem (Figure 2), for example, is an “innovation hub where third parties can share access and create new applications that incorporate elements of Google functionality. These outsiders can easily test and launch applications and have them hosted in the Google world, where there is an enormous target audience – 132 million customers globally – and a practically unlimited capacity for customer interactions.” This benefits both Google and its ecosystem-alliance partners, though Google, since it owns the platform, gets its products adopted widely and is able to extract a greater share of the value created (Iyer & Davenport, 2008).

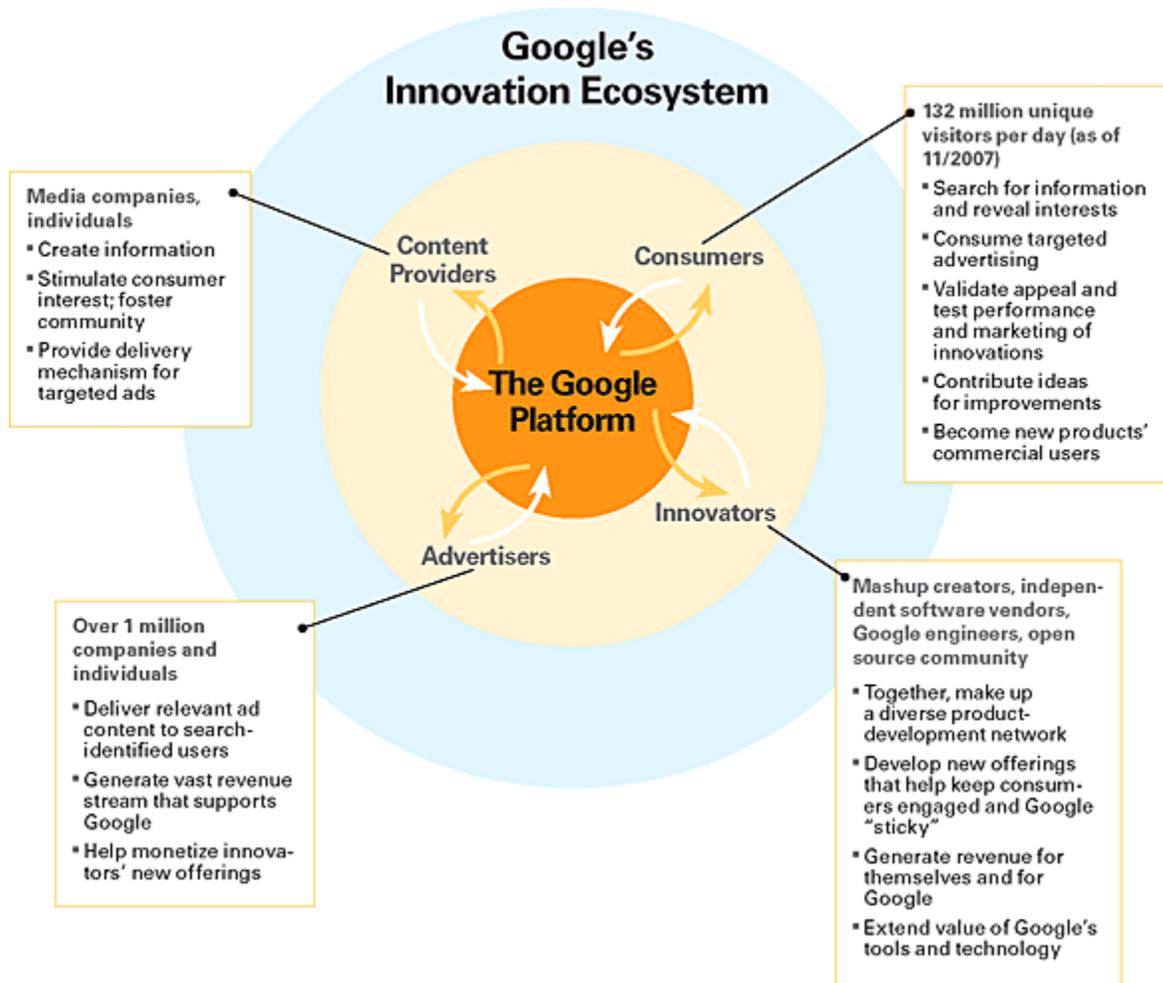
Corporate venture capital. Corporate venture capital, a subset of the traditional venture capital (VC) industry, involves major companies investing in nascent startups developing new or complementary technologies in which they are interested. This is a way for them to test ideas at a relatively low cost, and acquire the innovations if the startups are successful. Most of the major MNEs have active CVC funds to invest in startups with promising innovations. Google Ventures, the world’s largest CVC investor, is reported to have invested in over 300 startups in search of future blockbuster innovations. Some of the other prominent CVCs are Intel Capital, Salesforce Ventures, Qualcomm Ventures, Comcast Ventures, Novartis Venture Funds, Samsung Ventures, Siemens Venture Capital, Fidelity Biosciences, and so on. Corporate venture capital investing is quite prevalent and increasing in the computer and IT, biotechnology, and energy sectors, but not so much in consumer goods industries. In 2014, CVC investing accounted for “18.6% of total venture investment in the computer and peripherals sector, 13.7% in biotech and more than 10% in five other industries” (Caldbeck, 2015).

Outsourcing innovation. MNEs from developed countries have been outsourcing for decades corporate functions, such as manufacturing, to developing and middle-income countries that offer skilled workers at

low cost. In the 2000s, they began to offshore even core innovation and R&D functions to their captive centers and third-party vendors abroad. While MNEs have been performing R&D in foreign countries for a long time, what is relatively new is that they also now perform (and outsource) R&D in emerging markets. They do so because of the availability of low-cost talent in many emerging markets, the availability of third-party innovation providers with the requisite expertise, and to be close to their major markets. (See also the Global Innovation 1000 study discussed above, Tables 2-4).

When a firm offshores innovation, it can do so by setting up a wholly owned R&D subsidiary abroad, called a “captive center” or a “global in-house center,” or by outsourcing (offshoring) innovation to a third-party vendor in the foreign market. For example, dozens of major MNEs, including Cisco Systems, Computer Sciences Corporation, General Electric, and IBM have captive R&D centers in India, and they also outsource innovation projects to local vendors such as Tata Consultancy Services, Infosys, and Wipro Technologies.

Figure 2: Google’s Innovation Ecosystem



Source: Bala Iyer and Thomas H. Davenport, “Reverse Engineering Google’s Innovation Machine,” *Harvard Business Review*, April 2008.

Open Innovation

The concept of open innovation, or innovation through crowdsourcing or “open source,” was popularized by Henry Chesbrough in his 2003 bestseller, *Open Innovation: The New Imperative for Creating and Profiting from Technology* (2003). He distinguished between closed innovation, where R&D is performed in-house with little external inputs, and open innovation, where an organization also leverages external partners through crowdsourcing or other means to achieve innovation. He highlighted the need for companies to shift from a closed model of innovation to an open model to leverage the knowledge and ingenuity that exists outside the company. Though the idea of open innovation had existed and been used by companies like IBM, much earlier than Chesbrough’s publication, his main contribution was to democratize the idea to such an extent that hundreds of business, government, and nonprofit organizations now swear by it. The key ideas of open innovation he proposed are:

- Not all of the world’s smartest people work for us, so we must find ways to access the knowledge and creativity of people outside the organization;
- We do not have to originate innovation to benefit from it;
- Sometimes, the best solution to a problem comes from outside the industry that was seeking the solution;
- Making the best use of both internal and external ideas is the winning proposition;
- We should buy others’ IP if it advances our business, and should profit from others using our IP.

Open innovation thus involves accessing the knowledge and intellectual property of others (outside-in), as well as profit by allowing others to use our knowledge and IP (inside-out).

Inside-out. As indicated earlier, biotechnology firms routinely license or sell their technologies to large pharmaceutical firms. Licensing one’s technology is common in many other industries as well. However, companies like IBM, Xerox, and Samsung have thousands of patents that they do not use for various reasons. Chesbrough has suggested that firms with intellectual property should profit by letting others use their IP. About a decade ago, IBM and some other IT companies allowed free use of hundreds of their patents, creating something like an IP-free zone, pledging not to enforce their IP rights if the patents were used only for open-source applications. This came about with the publication of a 2004 report that showed that the open-source operating system Linux had (inadvertently) infringed upon more than 250 patents of other companies. This led to further growth of open-source software, unhindered by legal challenges, and IBM substantially increased its global share of Linux-based software (Alexy & Reitzig, 2012). Another example of inside-out is the innovation ecosystem of companies like Google, Cisco Systems, and Softbank.

Outside-in. The outside-in approach to innovation includes collaborating with individuals and entities outside the organization though crowdsourcing and other means. Some examples of the outside-in approach were presented above, such as incubators/accelerators and corporate venture capital.

One of the most powerful open-innovation ideas is prize-based innovation, i.e., innovation challenges backed by prizes offered by organizations seeking solutions to their problems through crowdsourcing. There are several innovation platforms that serve as intermediaries connecting organizations seeking solutions to specific problems and potential “solvers” from throughout the world, such as InnoCentive, NineSigma, and ideaCONNECTION. Many large organizations, including P&G, Unilever, IBM, Henkel, and Staples, have their own corporate open-innovation platforms serving their specific needs. The Unilever platform (Ideas4Unilever), for instance, invites suppliers, start-ups, academics, designers, and individual inventors – in fact, anyone with a practical innovation that can help the company meet its challenges – to submit their solutions to the company through its platform.

While the practice of offering a prize for a solution to a problem is an age-old idea, InnoCentive was the first company to develop a systematic approach and platform to connect organizations and potential solvers. InnoCentive got its start in the year 2000 as an incubator for Eli Lilly, a large U.S.-based pharmaceutical company, to try and crowdsource solutions to its technology-related problems. As the platform became well-known, other companies wanted to use it, and Eli Lilly spun it off as an independent company in 2005. InnoCentive links organizations (seekers) with specific problems (challenges) to people all over the world (solvers), who can win a prize for solving the problem.

One of the early successes InnoCentive had was a challenge posted on innocentive.com by the Oil Recovery Institute of Cordova, Alaska to keep oil in storage tanks from freezing, with a prize of \$20,000 for a solution acceptable to the Institute. A chemist from the construction industry, John Davis, won the prize by suggesting that they could keep oil from freezing by using a device similar to the one used in the construction industry to keep concrete from solidifying during delivery to a customer site by keeping it in a vibrating tanker. This was a simple solution that took John Davis just a few minutes to figure it out, and he was not even from the oil industry. This is a key rationale for opening up innovation to anyone and everyone.

As of late 2015, over 365,000 people from 200 countries were registered as solvers at innocentive.com, with a reach to over 13 million potential solvers through its strategic partners, such as Nature Publishing and Scientific American. Prizes range from \$5,000 to over \$1million, depending on the challenge, with over \$40 million in prizes given out so far. Over 50 percent of the registered solvers come from China, India, and Russia. As of late 2015, there are dozens of challenges posted on innocentive.com, with prizes ranging up to \$700,000 for the “Conquer Paralysis Now Challenge” Stage 1 awards. Similar prize-based challenges are announced by hundreds of organizations each year on intermediary platforms, like innocentive.com and ninesigma.com, as well as on their own corporate platforms. Innovation had for decades been an almost exclusive preserve of the advanced nations. Now, however, new global players have been coming from emerging markets, especially in the IT services industry. The following case study highlights capability building and innovation in India’s offshore IT services industry that have had a major impact on the disruption of global value chains in this industry.

Case Study: Capability Building and Innovation in India’s Offshore IT Services Industry

Multinational enterprises from the developed world have been offshoring IT services to emerging markets since the early 2000s. What is relatively new is that, during the last 5-10 years, they have also been offshoring their core innovation and R&D functions also to emerging markets – to their captive centers and to third-party vendors there. (See Figure 1 for the basic sourcing models used by MNEs). Over the last decade, India has emerged as the world’s largest offshoring hub for IT and business process outsourcing (BPO) services, with about 55 percent of total global offshoring going to India as of 2015. India has also been gaining global share in the offshoring of engineering, R&D, and product development services, with its 2015 global share estimated at 22 percent (ranked Number 2 among all R&D offshoring hubs).⁹

It is now well-known *what* caused the disruption of the value chains in the global IT services industry and *where* and *when* that happened. The question of *how* IT services providers in India became so dominant in the offshore IT services industry remains largely unanswered. This case study provides evidence of how India’s IT services firms, especially the major players, became dominant by systematically and continually acquiring the knowledge, capabilities, and innovations needed by their foreign clients. They essentially relied on the Build|Buy|Ally framework to develop such capabilities and innovations. The information presented here is based on in-depth personal interviews with over 20 senior and top-level executives of leading IT services firms in India and with some of their foreign clients. The list of companies interviewed is included in the methodology section towards the end of the case study.

The Global IT industry

The research firm, Gartner, classifies the global IT industry into five segments: data center systems, enterprise software, devices, IT services, and communication (telecom) services. Table 6 presents Gartner’s worldwide IT spending forecasts for 2015-2019 in current U.S. dollars as well as the compounded annual growth rate (CAGR) for 2014-2019. The global IT industry in 2014 was a \$3.74 trillion industry, of which the share of enterprise software and IT services was \$1.27 trillion. Of all industry segments, software and IT services are expected to grow at the fastest rates during 2014-2019, while the others have nominal or negative growth rates.

Table 6: Worldwide IT Spending and Forecasts for 2013-2019 (Current US\$ Billion)

Industry Segment	2013 Spending	2014 Spending	2015 Forecast	2016 Forecast	2017 Forecast	2018 Forecast	2019 Forecast	CAGR 2014-2019
Data Center Systems	164	168	169	172	174	176	177	1.05%
Enterprise Software	297	314	312	332	353	375	400	4.96
Devices	677	694	658	659	665	673	681	-0.38
IT Services	937	955	919	955	996	1,039	1,087	2.62

Communi- cation Services	1,605	1,606	1,495	1,499	1,527	1,551	1,572	-0.43
Overall IT	3,680	3,767	3,555	3,616	3,714	3,815	3,917	0.78
Software & IT Services	1,234	1,269	1,231	1,287	1,349	1,414	1,487	3.22

Source: Gartner, October 2, 2015

The Top 10 IT services firms in 2014, according to Gartner, were IBM, HP, Accenture, Deloitte, Fujitsu, Tata Consultancy Services, Capgemini, PwC, NTT Data, and Oracle. Tata Consultancy Services (TCS) is India's first and only IT services firm to join the ranks of the world's Top 10 IT services firms.

Gartner's Definitions of IT Industry Segments: **Data Center Systems:** Servers, external controller-based storage, enterprise network equipment, and enterprise communications applications. **Enterprise Software:** Applications and infrastructure software. **Devices:** PCs, tablets, mobile phones, and printers. **IT Services:** Business IT services and IT product support services. **Communication Services:** Mobile voice and data, and fixed voice and data services for both consumers and enterprises.

The global IT services industry consists of three types of enterprises – product companies, service companies, and Business Process Outsourcing (BPO) companies. However, the boundary between products and services is getting blurred all the time. The top IT product companies, such as Microsoft, typically have net global revenue per employee in the range \$0.5 million to \$1.0 million, though there are exceptions such as Apple. There are no major IT product companies headquartered in India. IT services companies, such as IBM, Accenture, and TCS have much less net global revenue per employee compared to product companies. Product companies also provide services, but typically only to support their own products and customers. Finally, BPO companies that provide services like accounting and call centers have even smaller net revenue per employee. Most IT services companies also offer lower value-added BPO services.

India's IT Services Industry

According to NASSCOM, India's premier IT software and services association, India's IT services industry's (including BPO and engineering and R&D) estimated 2015 revenue was \$146 billion. Of this, \$98 billion was in exports (i.e., foreign MNEs' offshoring to India) and \$48 billion in domestic sales. India's IT services industry¹⁰ grew at 13 percent from 2014 to 2015, compared to a growth rate of -5.5 percent for the global IT industry and -3 percent for the global software and IT services industry. Table 7 lists the top 10 IT and BPO services firms in India.

Table 7: The Top 10 IT and BPM Services Firms in India, 2013-14

Rank	Top IT Services Firms	Top BPM Services Firms
1	Tata Consultancy Services Ltd.	Genpact Ltd.
2	Infosys Ltd.	Tata Consultancy Services Ltd.

3	Wipro Ltd.	Serco Global Services Ltd.
4	HCL Technologies Ltd.	Wipro BPO
5	Tech Mahindra Ltd.	Infosys BPO
6	L&T Infotech	WNS Global Services (P) Ltd.
7	Syntel Ltd.	Firstsource Solutions Ltd.
8	MphasiS Ltd.	Aegis Ltd.
9	Genpact India Ltd.	Hinduja Global Solutions Ltd.
10	iGate	EXL

Source: NASSCOM, IT-BPM Sector in India: Strategic Review, February 2015

The Evolution of India's IT Services Industry

The IT services industry in India began in the early 1980s, and, by the mid-1980s, a few companies such as TCS and Infosys did considerable business supplying tech manpower to clients overseas, especially in the U.S., a practice that came to be known as body-shopping (now known by its more respectable term, *staff augmentation*). Indian IT services firms became first movers in the offshore segment of the industry in the 1990s. The dawn of the new millennium was the tipping point for India's IT services industry when literally thousands of companies worldwide needed programmers to rid their computers of the Y2K bug. With much of the Y2K manpower supplied by Indian IT services firms and by pure-play *body shops*, the corporate world finally woke up to India's potential in information technology services. The 1990s also saw the birth of the BPO (or Business Process Management, BPM) industry, when many Western firms began to offshore call-center and other back-office work to India. At the same time, many Indian IT services firms started to take up "complete jobs," such as ERP implementation, rather than just supplying manpower to their clients abroad.

By the 2000s, having thus proven themselves, Indian IT services firms were leading in several technology domains and client industry verticals, taking on more and more high value-added work for their foreign clients. MNEs also began to set up their captive centers (global in-house centers) in India during the 2000s.

Foreign companies offshore to India to benefit from labor cost arbitrage and Indian professionals' English language skills, but soon find other reasons to be in India, such as a growing domestic market and a large and high quality pool of multi-skilled engineers with a breadth of knowledge and expertise, as well as the ability to quickly understand clients' IT challenges and help resolve them. They also find that India's major IT services firms have deep knowledge of multiple verticals and technology domains, state-of-the-art processes, project management skills, and highly developed HR practices.

By now, large Indian companies have the scale and the slack resources to be able to ramp up the needed resources for a client quickly and cost effectively. And, with delivery centers and operations in dozens of countries and locations, they are able to service the needs of their clients offshore, onshore, or near-shore as needed by the client. They have the highest industry certifications, such as CMMI Level 5¹¹, and have successfully handled some very large projects for their clients. For instance, Mastek, ranked Number 20 among India's top IT services firms, created the IT backbone for one of the largest public health services

in the world, the National Health Service of Britain, and helped reduce traffic congestion in London by 20 percent.¹² And one of TCS China's key projects is the iCity (intelligent city) project involving a host of cloud-based IT solutions to provide integrated urban management services to promote economic, social, and sustainable growth in China.¹³

The Indian IT services companies have been in business for a long time and by now have the maturity, expertise, client relationships, and scale needed for large and complex projects for overseas clients. For many of the major players, the core senior management teams have stayed together for five, ten, or more years and who have not only acquired deep domain knowledge and knowledge of the verticals they serve, but have also developed and nurtured long-standing relationships with their clients. Their clients, typically chief information officers, tend to be risk-averse and often stick for quite some time with the providers with which they have had good experiences.

The IT-BPO industry now contributes almost 10 percent to India's GDP and is the largest private-sector employer in the country.

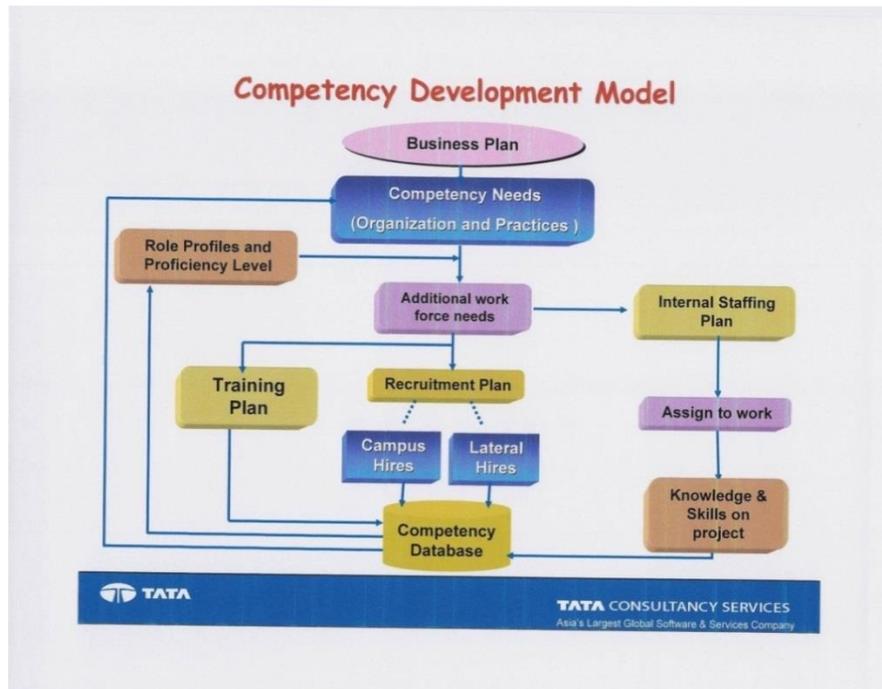
Capability Building in the Offshore IT Services Industry in India

According to a survey by the Conference Board, human capital is the second most critical challenge facing CEOs worldwide, and in India (and China) it is the most critical challenge they face (Mitchell et al, 2012.) A 2005 report by the McKinsey Global Institute on the demand for talent in services found that of all the engineering graduates coming out of colleges in India, only about 25 percent are suitable for employment by multinational corporations (Farrell et al., 2005). It is therefore not surprising that many Indian IT services firms have well-developed training and competency development programs for new (as well as continuing) employees.

Capability-building approaches. Most of the major and mid-sized IT services firms in India interviewed for this project have good to extensive capability-building programs. Due to space limitations, the discussion below focuses mostly on the human capital angle in capability building at some of the companies interviewed.

The TCS Competency Development Model (Figure 3) provides a good starting point for how major IT services firms in India go about capability development. Capability development typically starts with the identification of competency needs at the company and a survey of existing employees' proficiency levels. This leads to recruitment, selection, and training and development plans to have employees with the requisite knowledge and skills needed by the company.

Figure 3: The TCS Competency Development Model



Source: Gargi Keeni, “Evolution of Quality Processes at Tata Consultancy Services”, presented at SEPG Japan, September 2004

Recruitment and selection. Since employee attrition is a major concern, companies typically have aggressive recruitment, selection, and training and development programs. Capability building begins with a firm’s recruitment and selection policies and practices. Major IT services companies in India have huge recruitment and selection programs. The largest private sector employer in India, TCS, for instance, hired about 70,000 new employees worldwide each year from 2010-11 to 2012-13 (Table 8). They were hired through both campus and lateral recruitment programs in India and overseas, especially in United States, Canada, China, Uruguay, and Hungary. In 2012-13, the company had employees from 118 nationalities spread across almost sixty countries. The attrition rate at TCS was about the lowest in the IT services industry in India, ranging between 11 percent and 14 percent during these three years. The Infosys Group hired an average of 42,000 new employees each year during the three years, with the attrition rate ranging between 15 and 17 percent annually.

Table 8: Number of Employees, New Hires, and Attrition Rate for TCS and Infosys

Year	Tata Consultancy Services			Infosys Group		
	Total No. of Employees*	No. of New Hires	Attrition Rate	Total No. of Employees*	No. of New Hires	Attrition Rate
2012-13	276,196	69,728	10.6%	156,686	37,036	16.3%
2011-12	238,583	70,400	12.2%	149,994	45,605	14.7%
2010-11	198,618	69,685	14.4%	130,820	43,120	17.0%

* As of end of Fiscal Year (March 31)

Source: Company annual reports

With an employee base and growth like this, it is not hard to visualize the recruitment and selection policies and processes that major IT services companies in India must have to function effectively and remain at the forefront of their industry. During 2012-13, for instance, TCS visited 371 college campuses in India and made 24,531 job offers to students to join the company after graduation. This is in addition to their regular recruitment program worldwide. The highly competitive TCS campus recruitment process includes (1) an online aptitude test of quantitative, critical reasoning, analytical reasoning, and reading comprehension skills, and (2) a personal interview with technical and managerial employees. Infosys has a somewhat similar recruitment and selection process, with some of its recruitment tests being tougher than the GMAT and GRE tests. Of almost 3.8 million applications received in 2012-13, Infosys selected only about one percent of the applicants (37,036) for jobs at the company.

Internal training and development. Even with such highly selective recruitment and selection processes, major IT services companies put new recruits through intensive classroom and on-the-job training. For instance, at TCS, all campus hires begin their careers with an Initial Learning Program (ILP), a training program designed to provide them with the knowledge and skills necessary to succeed at TCS and in client engagements. Software engineers attend the ILP for six weeks, and all other entry-level associates for one week, receiving additional post-ILP training on the job and at client sites as needed. They have access to numerous web-based training courses in multiple disciplines and can also earn technical and professional certifications while at TCS. Employees are put through job rotation, not just within a function, but also between functions such as delivery and sales. All employees get exposure to different verticals and geographies, especially people identified for middle management positions. Each TCS employee receives at least 14 days of training per year, and there are tailored programs for leadership development. The company spends about 6 percent of its earnings on staff training and development each year. TCS invested 12,789 person years of effort in employee training and development during 2012-13.¹⁴

At Infosys, continuous learning opportunities are offered to employees along four dimensions – technology, client business domain, processes, and behavioral skills. The company's four in-house educational institutions and programs are Education & Research (E&R), the Infosys Leadership Institute (ILI), InStep – Infosys Global Internship Program, and Campus Connect. The E&R group has state-of-the-art technology and offers training to about 30,000 new recruits each year, as well as just-in-time courses delivered to employees based on unforeseen client needs, and other educational programs via e-learning. Employees have the opportunity to not only improve their competencies but to also obtain recognized certifications to further their careers. The Infosys Leadership Institute (ILI) is an in-house global business school offering leadership and management development programs intended for the top 600 or so employees in the company. Infosys spends about 2 percent of its annual revenues on employee training and competency development, making continuing education available to all employees at all levels. During 2012-13, Infosys provided employee training to the tune of 1.4 million person days, in addition to the external training and certifications received by employees.¹⁵

External training. Since the traditional colleges and universities do not produce enough students to meet the increasing demand for IT professionals, a number of private sector training institutions have been filling the gap in India. The most prominent of these is NIIT (formerly, National Institute of Information Technology), established in 1981. With hundreds of training centers in Asia, Europe, North America, and Oceania, NIIT is one of the Top 5 training companies in the world. In 2004, the company was reorganized

into two units – NIIT Limited, the training company, and NIIT Technologies Limited, which offers IT services.

The Government of India has established several Indian Institutes of Information Technology (IIITs) with a view to meeting the demand for IT professionals who have the requisite knowledge and skills needed by the IT industry. Twenty more IIITs are planned to be set up in the country as public-private partnerships, with plans to have an IIIT in each major state.

Corporate universities. Many companies have set up their own “corporate universities” to not only have the workforce they need but to also improve employee retention rates. Zoho Corporation, with operations in United States, India, China, and other countries, has established the Zoho University in Chennai, India, which pays high school graduates in India and the U.S. to learn to code. Over 60,000 high school graduates compete for some 60 places at Zoho University each year – an acceptance rate of 0.1 percent. Graduates of its 18-month program now make up about 15 percent of programmers employed by the company.

The most prominent corporate university in India is the “Infosys University”, formally known as the Global Education Center (GEC), in Mysore. Spread across 337 acres with 200 classrooms and 500 instructors, the GEC is the largest corporate education center in the world, with capacity to accommodate up to 5,000 students at a time. The GEC runs the Infosys Foundation Program for fresh engineering graduates as well as programs for other employees. Given its educational, residential, and recreational facilities, *Fortune* magazine has dubbed it as “an odd combination of Disney World, Club Med, and a modern American university.” The Infosys corporate university model has been copied by other companies, with training campuses proliferating in India’s office parks and electronic cities, and not just in the IT industry (Economist, 2010).

Innovation in the IT Services Industry in India

Digital economy companies survive and grow on innovations and new product introductions. Apple, Microsoft, Adobe Acrobat, and other IT product companies come up with new, upgraded versions of their digital products every few years. Companies selling smart phones, tablets, etc., try to come up with new, upgraded products every year, if not more often. For IT services companies, however, innovation is almost entirely customer driven. IT services firms also engage in innovation to improve processes and quality, lower costs, and to enter new technology domains and new industry verticals. Somewhat similar to their counterparts in advanced countries, major Indian IT services firms also utilize the BUILD|BUY|ALLY framework to acquire innovations, though, as of now, utilizing the “BUILD” and “ALLY” approaches more than the BUY approach. They do engage in M&A, but often to acquire new capabilities, enter new markets and new technology domains, and to strengthen presence in their existing markets.

Innovation through own efforts (BUILD). Some of the larger IT services firms in India have a strategic focus on innovation, with activities such as R&D labs, technology innovation centers, centers of excellence, in-house research and education groups, and other formal initiatives to encourage innovation within the company. TCS, for instance, has had a long history of innovation and established its first innovation lab in 1981 – the first ever and the largest software R&D center in India. In addition to

working on client-specific innovation projects, a key purpose of such initiatives is to create reusable assets based on the company's own IP and to develop IP-based products and business platforms. For example, Infosys has a portfolio of some twenty IP-based products and business platforms, called the Infosys Edge™, which it uses to offer services with an outcome-based pricing model. The research and innovation group at iGate has developed over 300 reusable assets in cloud computing, social analytics, big data, enterprise mobility, and high performance computing.

A summary of some of the innovation and R&D initiatives taken up by IT services firms in India is presented below much of which pertains to large IT services firms.

Innovation labs. TCS has a network of 19 global Innovation Labs located in India, the U.S., and U.K. focused on technologies such as Web 2.0 and software engineering, and verticals such as insurance and telecom. The Infosys Software Engineering and Technology Labs (SETLabs), established in 2000, are designed to identify technology drivers to help the company stay at the technology frontier. The Labs enable Infosys' 500 researchers to work with standards bodies on future technologies, share best practices, and maintain relationships with academic bodies, industry forums, conferences, and journals. The Technology Innovation Center at NIIT Technologies has a somewhat similar focus, and works on both current and future technologies.

Research and innovation groups. Many of the major IT services firms in India also have research and innovation groups, often involved in long-term, futuristic projects intended to sustain their competitive advantage. For instance, the Research & Education (R&E) Group at Infosys has dozens of Ph.D. scientists working on "totally futuristic" and long-term projects, and researching ideas "beyond IT" with potentially big impact. The Research and Innovation Group at iGate focuses on delivery innovation, technology incubation, business analysis, and industry thought leadership.

Innovation portals. Some companies have established innovation portals within their organizations to help employees exchange ideas among themselves and to encourage grassroots innovation. For instance, the Value Portal at HCL Technologies is an ideas exchange platform for employees and is the largest company-based ideas platform in the world. As of June 2012, over 10,000 employees had been involved in idea generation, generating some 12,600 ideas, of which 2,242 had been implemented and 629 were under implementation.

Open and collaborative innovation (ALLY). Genpact's *SolutionXchange* is an open innovation platform in which industry experts help generate solutions to business challenges posted by company employees and clients; significant financial rewards are offered to those submitting the most innovative solutions. Several of the companies interviewed for this project use collaborative innovation approaches whereby a company collaborates with clients and universities to develop technologies and applications. These typically include annual innovation forums held in different parts of the world in collaboration with clients and others (e.g., TCS), innovation workshops held jointly with clients (e.g., TCS's client innovation days and NIIT Technologies' innovation workshops for its largest 8-10 clients once/twice a year), innovation co-creation jointly with clients and partners (e.g., TCS and Infosys), ongoing partnerships with major universities (e.g., TCS and Infosys), and running R&D centers for clients using the offshore development center model.

An example of innovation co-creation is the Infosys Oracle Innovation Center housed in a state-of-the-art facility at Oracle headquarters in Redwood Shores, California and at Infosys's offshore development center in Shanghai and involved in joint research, joint IP licensing, and joint product development. TCS's Collaborative Innovation Network (COIN™), anchored at TCS Innovation Labs, connects players in the technology space, both large and small, to source innovations from multiple sources, including academic institutions, start-up companies, venture funds, multi-lateral organizations, and key clients, to develop innovative solutions for clients. Most recently, TCS announced in August 2015 a \$35 million gift to the Carnegie Mellon University of the U.S. to fund a new facility, a technology center, student scholarships, and education and cutting-edge research by faculty. This was the largest corporate gift ever received by CMU.

Some Implications for India's IT Services Industry

NASCOM has set an ambitious revenue goal for India's IT industry to reach \$350 billion by 2025 from about \$150 billion in 2015. This will not be easy – given the growing commoditization of the services business, rise of other geographies, continuing war for talent, rising costs, and rising customer expectations. We propose four innovative strategies for India's IT services firms to help them reach the ambitious goal.

1. Offer a new value proposition to your foreign clients who have become used to cost and talent arbitrage – a value proposition based on service consistency and guaranteed results, i.e., an opportunity for them to also benefit from “responsibility arbitrage.”
2. Build and upgrade capabilities continually – exploring avenues other than simply training and development – avenues such as joint ventures, M&A, technology collaborations with industry leaders, and open innovation.
3. Innovate, innovate, innovate. A few industry leaders are successfully using innovation to upgrade their service offerings, but most others tend to be satisfied with the status quo – enjoying high profits in the short term through exploitation of their existing assets, and not investing in R&D to explore new opportunities. You must try and achieve a balance between exploitation of existing assets and exploration of new opportunities through innovation.
4. Build deep relationships in the C-suite as you move up the value chain, not just at the CIO level.

Research Methodology

Findings in this study are based on in-depth, personal interviews with about 20 senior and top-level executives of almost 15 leading Indian IT services firms and their foreign clients, conducted mostly in spring 2013. Interviewees were asked questions related to their business models, core strengths and weaknesses, and specific approaches used for developing and upgrading knowledge, skills, and capabilities, as well as their views on the IT services industry. Each of the interviews lasted one-and-a-half to two hours or more and were conducted onsite at the companies' premises in India, China, and the United States. Some of the interviews were followed up with phone calls to get more information from the companies. This information was supplemented with information obtained from secondary sources such as company websites, industry publications, and published research. After analyzing interview data, the findings were presented back to some of the research participants for discussion and validation.

List of companies interviewed:

IT INDUSTRY ASSOCIATION, India

NASSCOM
President

INDIAN IT SERVICES COMPANIES

Genpact, Gurgaon

Senior Vice President

HCL Technologies, Noida

Strategic Partnership Manager
Deputy General Manager
Associate Vice President

iGate, Mumbai and Bangalore

EVP and Head of Strategy, Planning &
Marketing (Mumbai)
VP, Human Resources (Bangalore)

Infosys Limited, Bangalore

VP & Research Fellow, Education & Research

iknowvate Technologies, Mumbai

CEO

Mastek, Mumbai

Founder

MindTree, Bangalore

Chief Marketing and Strategy Officer

NIIT Technologies, Noida and Bangalore

Senior Vice President (Noida)
Chief Technology Officer (Bangalore)

Quattro Global Services, Gurgaon

Chairman and Managing Director

Tata Consultancy Services, Beijing

CEO, TCS China
General Manager, Global Business, TCS China

AMERICAN IT COMPANIES

Cisco (India and China)

Director, Cisco India*
Senior Project Manager, Cisco China

Computer Sciences Corporation (USA, India, and China)

Chief Innovation Officer & President, Global
Business Solutions Group (USA)*
Global Director, Office of Innovation &
Business Practices, CSC India*
General Manager, CSC India
Chairman, CSC Greater China

Google India, Bangalore

Product Manager*

IBM, Bangalore

Director, Systems & Technology Engineering*

* indicates interview in December 2010

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END NOTES

¹ The connected economy consists of markets, firms, consumers, governments, and other actors that are more connected to each other now than at any time in the past.

² See list of Google's acquisitions on Wikipedia.
https://en.wikipedia.org/wiki/List_of_mergers_and_acquisitions_by_Google. Accessed January 10, 2015.

³ Various sources including company website (www.hbo.com); Nicole LaPorte, "HBO to Netflix: Bring It On," *Fast Company*, May 2015; and Liam Boluk, "The State and Future of Netflix v. HBO in 2015," REDEF Original, March 5, 2015, accessed from <http://redef.com/original/the-state-and-future-of-netflix-v-hbo-in-2015>.

⁴ Sources include the company website (<http://www.amecfw.com/>); Kevin Baxter and Selina Williams, "Amec Rescued by Foster Wheeler Acquisition, Says CEO," *The Wall Street Journal*, November, 13, 2015; and Nils Pratley, "Amec's Foster Wheeler Buy May Deserve 'Transformational' Tag," *The Guardian*, January 13, 2014.

⁵ Cisco's New Innovation Engine accessed from <http://newsroom.cisco.com/feature-content?articleId=1720841>.

⁶ Vinod K. Jain and S. Raghunath, "Strengthening America's International Competitiveness through Innovation and Global Value Chains." In Ben L. Kedia & Subhash C. Jain, Eds., *Restoring America's Global Competitiveness through Innovation*. Cheltenham, U.K.: Edward Elgar, 2013.

⁷ Source: www.samsungaccelerator.com.

⁸ IBM's Press Release, "IBM to Acquire Cognos to Accelerate Information on Demand Initiative," November 12, 2007. <http://www-03.ibm.com/press/us/en/pressrelease/22572.wss>. Accessed on January 12, 2015.

⁹ The source for all data related to India is India's premier IT services association, NASSCOM (www.nasscom.in). Information about specific companies is based mostly on personal interviews and company websites.

¹⁰ For the rest of the chapter, the term "IT services" is used to represent IT services, BPM services, and engineering and R&D services.

¹¹ Carnegie Mellon University's Capability Maturity Model Integration (CMMI) is a process improvement appraisal system, especially for software development, with CMMI Level 5 being the highest certification level a company can achieve.

¹² Source: www.mastek.com.

¹³ Source: <http://china-wire.org/?p=29335>.

¹⁴ Tata Consultancy Services Limited Annual Report, 2012-13.

¹⁵ Infosys Annual Report, 2012-13.