

Do IPRs Promote Innovation?

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Abstract Innovation can be of two kinds: technological and business model innovations. The goal of innovation is to create value through implementation of viable commercial solutions to customer needs, wants, challenges, problems, or business opportunities that are open to exploitation. The primary role of IPRs is to protect inventions and innovations. The question is: “Do intellectual property rights (IPRs) promote innovation?” Though many expect to receive a clear “Yes” or “No” answer to this question, the right answer might be, “It depends.” This needs insightful analysis. Not all inventions lead to innovations. In fact, inventions made without any commercial understanding are unlikely to be of business interest. Naturally, IPRs protecting such inventions of little or no business interest do not promote innovation. However, IPRs of this kind could still create an alternative stream of revenue to the firm via licensing or sale, provided the firm knows how to effectively manage its intellectual assets. On the other hand, inventions with a strong business focus have a much higher probability of leading to successful innovations. IPRs protecting such inventions and innovations become part of the intellectual capital of firms, affording unique products/services, contributing to protected growth and competitive advantage, and attracting the attention of investors and shareholders. Consequently, this leads to higher market capitalization of such firms and raises the market expectations of shareholders and investors of even higher returns on their investments. Thus, such IPRs actively promote innovation. This paper presents evidence for the above hypothesis based on examples of firms from both the USA and India and the role of IPRs (patents, designs, copyrights, trademarks, trade secrets, and geographical indications) in promoting technological and business model innovations.

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1 Introduction

According to the World Intellectual Property Organization (WIPO), “Intellectual Property (IP) refers to creations of the mind, such as *inventions, literary and artistic works, designs and symbols, names and images used in commerce*.” WIPO further states that “IP is needed for many reasons: First, the progress and well-being of humanity rest on its capacity to create and invent new works in the areas of technology and culture. Second, the legal protection of new creations encourages the commitment of additional resources for further innovation. Third, the promotion and protection of intellectual property spurs economic growth, creates new jobs and industries, and enhances the quality and enjoyment of life” (WIPO, http://www.wipo.int/edocs/pubdocs/en/intproperty/450/wipo_pub_450.pdf).

The proponents of IPRs cite many fundamental arguments on the positive role of IPRs (Newman and Rothschild 2002; Shearer 2007) such as incentivize people to be creative, reward individuals for their creative efforts, afford legal rights to people for their creative efforts, fulfill the principle of moral rights, encourage public disclosure of inventions, facilitate technology transfer, promote growth in innovation investments, and guide the industrial policy and strategy of the nation.

In addition, IPR researchers (Davis 2006) cite many other benefits for patents. Firstly, when a firm invests considerable human and relationship capital and incurs significant R&D expenditures to get to the invention stage and transform it into a useful innovation that satisfies the customer/consumer needs, *it needs IPRs to protect such inventions and innovations against imitations*. Further, *innovators would like to have time to recover their costs and reap benefits for their efforts through superior products/services, which command premium prices in the market, and be able to invest in newer inventions*. Firms could use IPRs *defensively and offensively* (Bertin and Wyatt 1988; Hanel 2006; Mansfield et al. 1981; Oppenlander 1977). Secondly, *patents could serve as alternative sources of revenue to firms through licensing or sale, in noncompeting applications*. They may also *strengthen a firm’s position in negotiations* (Grindley and Teece 1997; Hall and Ziedonis 2001). Thus, *patents establish the legal basis for cooperation*. Finally, IPRs could *enhance the market capitalization of the firm, acting as strategic signals of the strengths of the firm* (Rivette and Kline 2000a, b). This may also help the firm to attract more capital from investors and shareholders. Thus, *patents may serve as indicators of firm’s value*.

Interestingly, however, the critics of IPRs strongly believe that IPRs actually hinder innovation and contribute to too many negative effects. In fact, one of the researchers from Michigan, USA, reported empirical studies in the 1990s to show that IPR protection is not a reliable mantra for promoting either innovation or well-being of all the people in the world (Deardorff 1992).

The IPR critics (Hamilton 1996) cite just as many reasons on the negative consequences of IPRs. According to them, IPRs prevent the public from being able to fully access the details of innovation due to exclusive rights, raise the costs to consumers, create unhealthy monopolies, misdirect innovation efforts to just profitable areas and not to what is important to public, lead to unnecessary

competition rather than cooperation, are so expensive to obtain and maintain that they stay out of reach of poor and unsophisticated individuals/organizations, necessitate highly bureaucratic organizations and elaborate rules of governance, and create conflicts between legality, morality, and ethics (Gollin 2008).

This brings us back to the central question: “Do IPRs promote innovation?” Proponents claim, “Absolutely, Yes,” while opponents declare, “Certainly, Not.” According to this author, the truth lies somewhere between these two extreme viewpoints, and the correct answer may be, “It Depends.” The present paper builds a cogent theory in support of this hypothesis and cites evidence to support it.

2 Discussion

There has always been a debate among the researchers, practitioners, and policy makers regarding *whether IPRs actually help or hurt innovation*. Recently, two research studies – one in the USA and the other in the European Union – have reported extensive results on the distinct impact of *various forms of IPRs* on innovation, employment, wages, and GDP growth:

2.1 The ESA-USPTO Study

The US Economics and Statistics Administration (ESA) and the US Patent and Trademark Office (USPTO) reported a pioneering research study on the impact of various forms of IPRs – namely, *patents, trademarks, and copyrights* – on innovation and creativity and other major benefits such as GDP growth and employment (ESA-USPTO Study 2012). This study argues that “Innovation – the process through which new ideas are generated and successfully introduced in the marketplace – is a primary driver of U.S. economic growth and national competitiveness.” In addition, the study states that “*Innovation protected by IP rights is key to creating new jobs and growing exports*. Innovation has a positive pervasive effect on the entire economy, and its benefits flow both upstream and downstream to every sector of the U.S. economy. IP is not just the final product of workers and companies—every job in some way, produces, supplies, consumes, or relies on innovation, creativity, and commercial distinctiveness. Protecting our ideas and IP promotes innovative, open, and competitive markets, and helps ensure that the U.S. private sector remains America’s innovation engine.” In one of the summarizing statements, this study concludes, “IP is used everywhere in the economy, and IP rights support innovation and creativity in virtually every U.S. industry.”

Using relevant data and statistical measures, the USPTO Study made significant findings about IPRs and the US economy that are instructive to the rest of the world: “While the entire U.S. economy relies on some form of IP or the other, every industry either produces or uses it.”

2.1.1 Employment

Among a total of 313 industries examined in the US economy in 2010, 75 industries (24 %) are found to be *IP-intensive*. These IP-intensive industries directly accounted for 27.1 million American jobs (18.8 %) of all employment. The share of IP-intensive employment in the USA was as follows: 60 *trademark-intensive* industries accounted for 22.6 million jobs, 26 *patent-intensive* industries provided 3.9 million jobs, while the 13 *copyright-intensive* industries afforded 5.1 million jobs.

In addition to directly supporting 27.1 million jobs in 2010, IP-intensive industries also indirectly supported 12.9 million more jobs in the US economy. Described differently, every two jobs in the IP-intensive industries approximately create one more job elsewhere in the economy. Counted this way, 40 million American jobs (27.7 %) were attributable (directly and indirectly) to the IP-intensive industries.

From 1990 to 2011, employment in the IP-intensive industry grew by 2.3 %. In comparison, employment in non-IP-intensive industries was 21.7 % higher in 2011 than in 1990. The patent-intensive industries experienced higher employment losses over this period as they are all in the manufacturing sector. Most notable performance during the period 1990–2011 belongs to copyright-intensive industries which provided a sizeable employment boost, growing by 46.3 %.

From 2010 to 2011, recovery of the US economy led to a 1.6 % increase in direct employment in IP-intensive industries, compared to only 1.0 % growth in the non-IP-intensive industries. Analysis revealed that copyright-intensive and patent-intensive industries grew by 2.4 % and 2.3 %, respectively, while trademark-intensive industries grew by 1.1 %.

2.1.2 Wages

This study also found that wages in IP-intensive industries are also higher compared to non-IP-intensive industries. Average weekly wage premium in IP-intensive industries grew from 22 % in 1990 to 42 % in 2010 and outperformed the average weekly wage premium in non-IP-intensive industries. In patent-intensive industries, average daily wage premium increased from 66 % in 2005 to 73 % in 2010, while the same in copyright-intensive industries grew from 65 to 77 %. Closer examination revealed that wages in IP-intensive industries, on average, correspond to higher educational level of the workers. In 2010, the college educated among all workers (> age 25) constituted 34 % in non-IP-intensive industries, while the same constituted more than 42 % in IP-intensive industries.

2.1.3 GDP Contribution

In 2010, IP-intensive industries accounted for 34.8 % of US gross domestic product (GDP) about \$5.06 trillion in value.

While policy issues are not the subject of this report, it highlights the importance of balanced IPR system that *protects the rights of creators/inventors from unlawful use of their work while promoting innovation*. Also, while the report shows strong evidence for how IP rights support innovation and creativity, it also cautions that one must work to respect the limits such as fair use which balance the public's right to use content legally with IP owners' interests.

2.2 The OHIM-EPO Study

According to this study (OHIM-EPO Study [2013](#)) by the Office for Harmonization in the Internal Market (OHIM) and the European Patent Office (EPO), "Innovation is one of the areas covered by the five key targets set in "Europe 2020", the ten-year growth strategy adopted by the European Union with a view to creating a more competitive economy with higher employment. It has never been so important to foster the "virtuous circle" leading from Research and Development (R&D) investment to jobs – via innovation, competitive advantage and economic success – as in today's world of increasingly globalised markets and the knowledge economy. This process depends on several different factors, but an efficient system of intellectual property rights (IPR) undoubtedly ranks among the most important, given IP's capacity to encourage creativity and innovation, in all its various forms, throughout the economy."

Hence, as a sequel to the USPTO Study, OHIM and EPO jointly reported the results of their systematic research on the role of a broad range of IPRs – namely, *trademarks, patents, designs, copyrights, and geographical indications (GIs)* – in promoting creativity and innovation and established sound evidence for the European Union in terms of reliable facts and figures. Though all industries either create or use IPRs to some extent, this study defines IPR-intensive industries as those having an above-average use of IPR/employee. On this basis, the study reports that about 50 % of European industries are IPR intensive.

The principal findings of this study, like those of the USPTO Study, are highly instructive to the rest of the world:

2.2.1 Employment

From 2008 to 2010 IPR-intensive industries generated 56.5 million jobs (26 %) out of a total of approximately 218 million jobs in the EU. The individual contributions of different industries to employment are instructive: nearly 21 % in *trademark-intensive*

industries, about 12 % in *design-intensive* industries, approximately 10 % in *patent-intensive* industries, 3 % in *copyright-intensive* industries, and 0.2 % in *GI-intensive* industries.

Further, 20 million additional jobs were generated in industries that supply goods and services to the IPR-intensive industries. Thus, taking both direct and indirect jobs into consideration, the total number of IPR-dependent jobs was just under 77 million (35.1 %). Over the same period, IPR-intensive industries generated almost 39 % of total economic activity (GDP) in the EU, worth € 4.7 trillion. They also accounted for most of the EU's trade with the rest of the world, with design-intensive, copyright-intensive, and GI-intensive industries generating a trade surplus.

2.2.2 Wages

This study found that IPR-intensive industries pay significantly higher wages than the other industries, with a wage premium of more than 40 %. This is consistent with the fact that *the value added per worker is higher in IPR-intensive industries than elsewhere in the economy*.

2.2.3 GDP Contribution

Besides employment, IPR-intensive industries contribute to economic output, as measured by GDP. While almost 39 % of EU GDP is generated in IPR-intensive industries, trademark-intensive industries account for 34 %, design-intensive industries for 13 %, patent-intensive industries for 14 %, copyright-intensive industries for 4.2 %, and GI-intensive industries for 0.1 % of GDP.

Thus, the OHIM-EPO Study concludes in this report that “There have already been several studies on specific IP rights, industrial sectors or countries, but the OHIM-EPO study is the first to quantify the overall contribution made by IPR-intensive industries to the EU economy, in terms of output, employment, wages and trade, taking into account the major IP rights. Despite the conservative approach, reflected in the rigorous methodology applied, the main results are very impressive: IPR-intensive industries generate more than a quarter of employment and more than a third of economic activity in the EU.”

2.3 Analysis and Insights

In line with the above two research studies, this chapter claims that if we focus our research on the right evidence, we would arrive at the right conclusions and points out that *IPRs promote both technological and business model innovations, under the right set of conditions*. What are such conditions? The “Is and the IPRs Model”

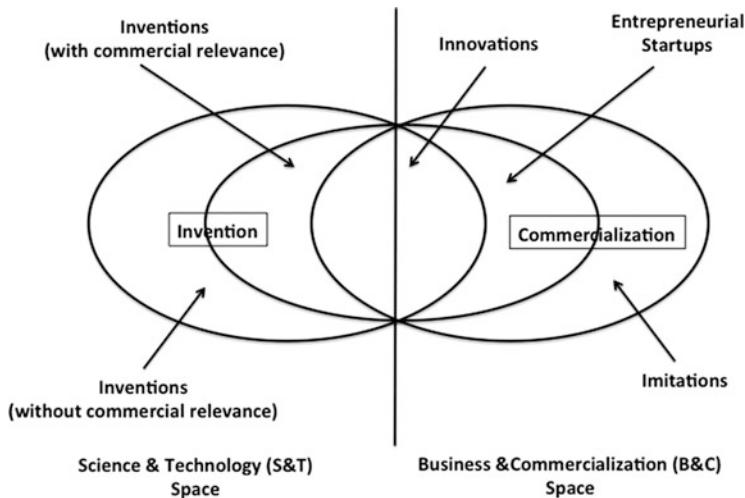


Fig. 1 Is and the IPRs Model

(IsIPRM) (Fig. 1), advanced by this author (Racherla 2014), analyzes the background for invention and innovation and provides the necessary insights for IPR promotability of innovation.

The “Is and the IPRs Model” (IsIPRM) is based on the following principles:

There are two “spaces” that we must consider in order to evaluate innovations and their dependence on IPRs. They are (a) the Science and Technology (S&T) space and (b) the Business and Commercialization (B&C) space.

“Inventions” take place in the S&T space. *Patents* are a preferred form of IPRs used for the protection of *inventions*. Scientists and engineers – working alone or in universities, research institutes, and industries – develop inventions and apply for *patents* to protect their work. In this manner, we see today that many individuals, organizations, and even nations accumulate very large numbers of patents. Thus, there is a race for patents among individuals, organizations, and nations, on the assumption that *patents are a quantitative measure of innovativeness*. In fact, a vast majority of such inventions do not go to commercialization and may even turn as “weapons against innovation” in the hands of patent trolls. This is because inventions that are not rooted in commercial understanding do not generate commercial interest but may attract patent trolls. So if we use *the percentage of conversion of patents into commercial products/services as a measure of the IPR promotability of innovation*, we will surely be disappointed and conclude that “IPRs do not promote innovation.”

“Business founders” inhabit the B&C space. These are also sometimes referred to as the “classical entrepreneurs” (Sundbo 1998). These individuals are considered by many as *not inventive* because they start businesses based on *tried* ideas, *known* technologies, and *proven* business models. In other words, their business efforts may be described as “imitations.” These risk-averse individuals may protect their

businesses with *trademarks* and *copyrights*. Clearly, there may be many IPRs of this kind in the B&C Space. If we look for the *impact of these trademarks and copyrights on breakthrough or disruptive innovations*, we may again get the wrong answer: “IPRs do not promote innovation.”

“Entrepreneurs” also operate in the B&C space and are indeed responsible for successful entrepreneurial start-ups. Such entrepreneurial start-ups may become IPR intensive in one/multiple forms of patents, trademarks, copyrights, designs, and GIs.

IsIPRM theorizes that “innovations” take place at the intersection of S&T space and B&C space. Innovations may demand an entire range of IPRs to protect them. These are country dependent. In the USA, they are *patents, copyrights, trademarks, and trade secrets*. In India, they are *patents, designs, copyrights, trademarks, trade secrets, integrated circuits (ICs), plant varieties (PVs), GIs, and traditional knowledge (TK)*.

Innovations are of two kinds: *technological* and *business model*. Both of them require protection by the full range of IPRs. IsIPRM asserts that in order to reliably answer the question, “Do IPRs promote innovation?,” one needs to examine the impact of a full range of IPRs and not just patents.

IsIPRM suggests two important ideas:

- (a) *All IPRs may not promote innovation.*
- (b) *Only IPRs protecting sustainable innovations – which possess economic, social, and/or environmental value – promote innovation.*

This leads us to the next important question: “What makes innovations sustainable?” To answer this question, we suggest that one must consider the *innovation life-cycle-innovation impact diagram* (Fig. 2).

Innovation impact may be defined as the incremental revenues, profits, market share, and competitive advantage attributable to innovation. Innovation life cycle may be defined as the total time over which innovation delivers those benefits to the firm. Thus, all innovations have a *finite* life span (Kaplan, Innovation Point). Consequently, the *innovation impact* must be captured *within* the *innovation life cycle*.

The impact (economic/social/environmental) of a *successful* innovation starts off slowly, gradually picks up, dramatically increases over a period of time, and then finally tapers off – thus forming an *s-shaped curve*. Thus, one may start with an original technology first. Then, a new generation technology/improvement of the original technology (labeled as technology 1) obsoletes the original technology. Next, a newer generation technology/improvement of technology 1 (labeled as technology 2) obsoletes the new, and so on. *Our research reveals that IPRs play a vital role in this regard by protecting the original innovation each time and allowing time for inventors and innovators to come up with new and newer technologies. However, if such IPR protection were to be absent, innovations lose to imitations and die much faster in the marketplace. This is how IPRs sustain and promote innovations.*

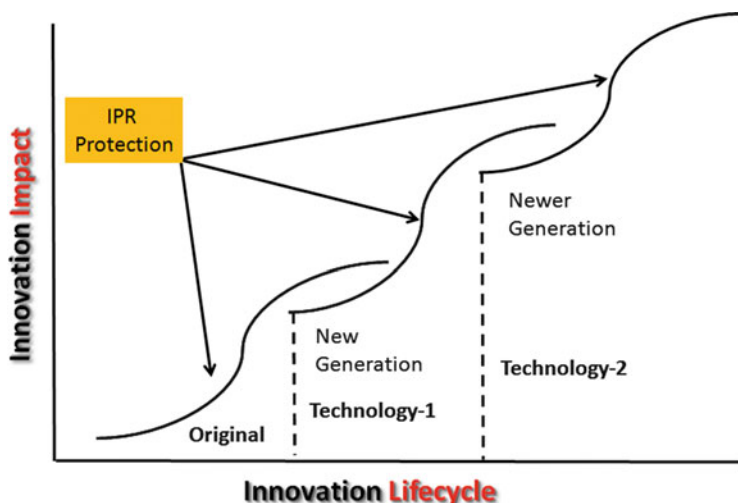


Fig. 2 The innovation lifecycle – innovation impact diagram

This brings us to the third important question: “Can we construct a theoretical framework to rationalize how IPRs actually sustain and promote innovation?” Accordingly, we propose the *model for sustenance and promotion of innovation* (Fig. 3), shown below.

This model synthesizes generally accepted principles as shown below:

A firm starts by leveraging its *resources and ideas* and generates *inventions*. Some of these inventions, which have strong business focus, lead to either *technological* (technology-push/market-pull) or *business innovations*.

The firm chooses IPRs to protect *some but not all* of the inventions and innovations. There could be many reasons for this: (a) some of them may be incremental advancements, (b) they may not meet IPR statutes, (c) they may serve the firm better as trade secrets, or (d) they do not fit the firm’s vision and can remain as firm’s proprietary knowledge assets. Thus, one can imagine that out of a large number of inventions, *only the most important* may receive IPR protection, if the company is IPR savvy.

If the firm is business savvy, perhaps *some* of the IPR-protected inventions may translate into innovations. *However, no one can guarantee that all innovations will be successful and provide the innovation impact that the firm is actually hoping for.* Thus, only a fraction of all the innovations taken to commercialization may be highly impactful in the marketplace.

These *IPR-protected inventions of the firm* may attract the interest and attention of the investor world. The IPR-protected commercially impactful innovations help the company (a) *to increase revenues, profits, and market share* and (b) *to develop sustainable competitive advantage.*

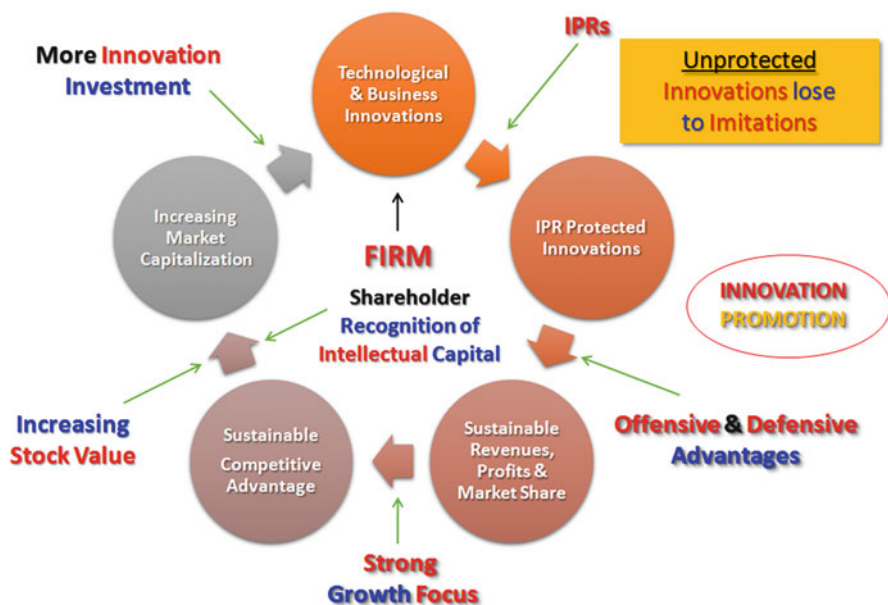


Fig. 3 Model for sustenance and promotion of innovation

This is the point at which shareholders and investors of the firm take a good look at the firm and learn about its entire intellectual capital. This contributes to *stronger investor confidence* and leads to *increasing stock value*.

A *stronger stock value* increases the firm's *market capitalization*. This brings more infusion of capital to the firm, based on mutually favorable terms.

This, in turn, raises market expectations for higher return on investment (ROI), leading to greater demands for more innovation. At this stage, the firm *shows greater commitment for more innovation to achieve sustainable growth and competitive advantage*. Indeed, this is how *IPR promotion of innovation* works.

Thus, our research suggests that IPRs protecting successful innovations promote innovation. In this chapter, we present examples from both the USA and India in support of the above hypothesis: *IPR promotion of innovations* at the Gillette Company (the USA), Tata Motors (India), Dhama INNOVATIONS® (India), Hindustan Unilever Limited (India), Aravind Eye Care System (India), FINO PayTech Ltd. (India), Narayana Health (India), Bharti Airtel (India), Darjeeling Tea (India), and Kanjeevaram Silk Sarees (India), to illustrate a few examples.

3 IPR Promotion of Technological/Business Model Innovations

3.1 *The Gillette Company (Before/After P&G Acquisition)*

Recently a paper was presented at the DRUID in Copenhagen (Sternitzke 2012) that researched the Gillette Company, a company known for strategic IP management, and reported how a firm could enhance value appropriation of modular and integral products by creating interlocking IP. Thus, the study examined patent filings on the Gillette Fusion razor and concluded: “Several levels of interlocking activities were identified, including patent claims following a hierarchical structure and filings of overlapping content in multiple patent families. In general, the degree of coupling of technological components as well as business model achieves the creation of interlocking patents which, for integral systems, further enhances complexity.” *It is precisely this complexity resulting from interlocking patents that protects innovations of the Gillette Company (now P&G), builds sustainable competitive advantage, and promotes future innovations.*

The Gillette innovation story during its early years is well analyzed in the literature (Picker 2010). The history of Gillette began on November 15, 1904, when Gillette was awarded two US patents (US775,134 and US775,135) for razors, *thin* double-edged blades and a combination of the two. At that time, the best available shaving technology employed *reusable* blades that were quite heavy and required professional help for sharpening, requiring consumers to mail their razors to professionals for sharpening. That meant consumers had to have replacement razors, translating into high expenditures. Gillette understood these difficulties of consumers, invented thin double-edged blades, and created a *disposable blade market*. From 1904 to 1921, Gillette could have set low prices for its handles (or even given away free handles) and high prices for its disposable blades (known as the razors-and-blades strategy) to shut off competition and make high profits. But it did not. Instead, Gillette set a relatively high price for its handle compared to competing razors and fought to maintain those high prices during the life of the patents. *Thus, with its two patents, Gillette could block other firms from the disposable blades market from 1904 to 1921.*

Obviously, this gave Gillette ample time to come up with newer innovations and it did. It invented a new razor handle. When the 1904 patents were going to expire, Gillette introduced the razors-and-blades strategy in 1921. Before the expiry of the Gillette patents, the shaving market was segmented. Gillette sold razor sets (handle with one blade) at \$5.00 and a packet of 12 replaceable blades at \$1.00 only at the high end, while competitor brands, such as Ever Ready and GEM Junior, sold their razor sets at \$1.00 at the low end. However, shortly after the expiry of its two patents, Gillette introduced its newer innovation, a razor set with the new handle at \$5.00 (at high end of the market), and sold a razor set with the old handle at \$1.00 (at lower

Table 1 Select patents of Gillette that illustrate synergistic promotion of innovation

US patent #	Filing date	Title	Comments
775,134; 775,135	December 3, 1901	Razor	These patents claim the invention of a specially designed razor that uses a thin double-edged blade, made from a thin sheet of steel that works in a stable rigid blade holder. Blades remain sharp in use and can be thrown away when dull as they are cheap. The earlier razors used heavy bulky blades that required inconvenient, expensive, and time-consuming honing or stropping by professionals
991,147	January 18, 1905	Safety razor	“Spring-pressed clamping jaw feature” was added to give a more close shave
1,111,721	March 6, 1905	Safety razor	An improved “head” to hold the blade steadily
1,158,480	December 7, 1910	Safety razor	A three-part holder with interchangeable blades prevents contact while sliding under the overlying part so as to avoid the edges from becoming dull. The insertion and removal of blade was assisted by a spring
187,346	June 11, 1959	Razor blade dispenser	Design patent protecting the blade dispenser filed by the company wherein King Gillette was not the inventor. This shows that company was developing expertise in blade market
3,724,070	March 17, 1971	Dual-razor blade assembly	Plurality of blades having cutting edge extended in the same direction. This was most important as it paved way for Mach 3 and “Fusion”
267,438	August 7, 1980	Razor	Detachable twin razor blades for use and throw blades
5,787,586	April 10, 1986	Shaving system and method	Trademarked as Mach 3 with three blades for a smooth shave with less pressure to the skin and with fewer strokes, thereby reducing skin irritation
20050039337	March 11, 2004	Shaving razors and other hair	The number of blades increases the quality of shave and reduces irritation. However, more blades increase drag, leading to a reduction of maneuverability. This drawback is removed by altering the angles of blade
		Cutting assemblies	
8,745,883	August 30, 2011	Razor handle with rotatable portion	The handle and razor can rotate about the axis for a comfortable and smooth shave. This is useful for 2, 3, or 5 blade razors

end of the market). It also sold a packet of 10 disposable blades (instead of 12) at \$1.00. *This is how Gillette coupled technological innovation with business model innovation (pricing strategy) to create a sustainable competitive advantage for itself.*

Thus, from 1921 to 2005, Gillette held its market leadership by promoting several first-to-market technological innovations (with interlocking patents), making its own

technologies obsolete, and coupling with hard-to-imitate business model innovations, to achieve sustainable growth and competitive advantage (Thin Blades, 1934; TTO Razor, 1947; Techmatic, 1960; Trac II, Trac II Plus, 1971; Good News, 1976; Sensor, 1990; Mach III 1998; Fusion, 2005). Table 1 shows some of these examples. After P&G acquisition (2005–2015), Gillette continues to enjoy market leadership due to innovations based on the new strategy of razors and shaving gels.

3.2 *Tata Motors*

Tata Motors is one of the most innovative companies in India (TATA <http://www.tata.co.in/company/articlesinside/0qS4YCfqhAU=/TLYVr3YPkMU>, Business Today 2014).

3.2.1 *Tata Indica*

In 1998, Tata Motors innovated Tata Indica, which was India's first indigenously designed and developed passenger car that relied entirely on in-house Tata expertise. Indica has not just succeeded, but it also went on to become the best-selling car in its segment despite competition from some of the leading automobile companies in the world. Today, Tata Indica is a well-recognized and respected auto brand (*trademark*) that stands for affordability as well as quality in terms of mileage, driving comfort, and safety – simply stating “more car per car.”

Over the past decade, Tata Indica's brand success triggered the introduction of many more innovations by Tata Motors into this category, namely, Indica 2000, V2, V2 Turbo diesel, Xeta, Xeta LPG, Indica Dicor, and finally Indica Vista – targeting specific market segments. The latest innovation, Indica EV, the electric version, is Tata's answer to sustainability.

3.2.2 *Tata Ace*

The success of Tata Indica brand led Tata Motors to introduce yet another breakthrough innovation – India's first indigenously developed mini-truck, Tata Ace, in 2005. What is so special about it? Tata Ace's unique value proposition is that it offered the small trader/farmer an affordable, fuel-efficient transport solution that effectively met his business needs. Indeed, Tata Ace is a 4-wheeler at 3-wheeler price. Further, its unique features were fuel-efficient 2-cylinder Indica engine, tough body, high-ground clearance (critical to India's roads), rigid front axle and rear wheel drive, and enhanced loading space. Indeed, Tata Ace's high-performance, low-maintenance design was a remarkable success. Within one and a half years, Tata Motors was able to sell 100,000 trucks.

Table 2 Select patents of Tata Motors that illustrate synergistic promotion of innovation

Indian patent application	Date	Title	Comments
220/MUM/2007	August 7, 2007	A novel in-line two-cylinder direct injection high-pressure common rail four-stroke reciprocating piston internal combustion turbocharged diesel engine	While the prevalent light commercial vehicles (LCVs) and small passenger cars were using 3- or 4-cylinder four-stroke/IC engines, this invention achieved the features of a 4-cylinder engine (direct injection common rail, turbocharged, intercooled, and overhead camshaft engine) in a 2-cylinder engine suitable for LCVs and small passenger cars. This enabled Tata Motors to come up with technological innovations (Ace, Nano) that gave competitive advantage
587/MUM/2007	March 29, 2007	A novel integrated shaft for two-cylinder internal combustion in-line common rail diesel engine	Integrated shaft is critical to 2-cylinder IC engines to balance the reciprocating unbalanced mass of the engine due to high-pressure fuel injection pump. This drawback makes the 2-cylinder engine unsuitable for power and efficiency. This invention of integrated shaft makes the system less complex and eliminates the unbalanced mass problem
651/MUM/2007	March 30, 2007	A novel integrated module for inlet manifold, valve cover, exhaust gas recirculation, blow-by oil separation with provision of oil filling for the two-cylinder internal combustion in-line common rail diesel engine	This invention integrates multiple functions in a single module to ensure compactness of the 2-cylinder engine. The internal curvature of the inlet manifold ensures smooth airflow and uniform distribution of mixture of fresh air and recirculated exhaust gases making the engine more efficient
2602/MUM/2007	December 28, 2007	A novel integrated bedplate structure for 2-cylinder, direct injection, high-pressure, common rail, 4-stroke reciprocating internal combustion diesel engine	This invention provides the much-needed effective support system for cylinder block, crankshaft, and balancer shaft for optimal engine output
06/MUM/2008	January 1, 2008	A novel integrated flywheel assembly for 2-cylinder direct injection high-pressure common rail four-stroke reciprocating	The invention reduces the rotational speed fluctuation and transfer of engine power and provides the input to engine

(continued)

Table 2 (continued)

Indian patent application	Date	Title	Comments
		piston internal combustion diesel engine	speed measurement. This is critical to a 2-cylinder high-pressure IC engine and imparts more power and torque in a “small” engine
56/MUM/2008	January 8, 2008	Cylinder head 2-cylinder IC engine	Optimized cylinder head for reciprocating piston 2-cylinder IC engine for low-cost, compact-size, low-weight, low-fuel consumption, and low-ventilation gas. This engine can be used for small cars or LCVs
61/MUM/2008	January 8, 2008	A novel crank case for an in-line 2-cylinder IC engine	This invention aims at the balancer shaft for 2-cylinder engines. This helped the company to launch Ace and Nano (the lowest-priced people’s car)

3.2.3 Tata Nano

Chairman Ratan Tata conceived the idea of a low-cost car for bottom-of-the-pyramid Indian consumers that did not compromise on safety/comfort/quality and served as an alternative to the unsafe 2-wheelers. Indeed, Tata Nano may be the most notable innovation of Tata Motors as it is the world’s cheapest car ever manufactured.

It is a car sold at a price of approximately US\$ 2000. Not surprisingly, Tata Nano’s price itself has become the subject of the innovation story. Tata Nano met all of the Indian standards in terms of emission, pollution, and safety. In addition, it offered a fuel efficiency of 50 miles/gallon. Tata Motors filed for 34 patents in support of the design of the Nano. Table 2 shows some of the key patents.

According to Rajiv Dube, president of Tata Motors Passenger Car Division in India, “We have built a robust Rs 10,000 crore Tata car business, but have sold over 1.1 million cars, built a strong relationship with Fiat, acquired world-class brands such as Jaguar and Land Rover, and announced the most awaited car in the world – the Nano. *All this may not have been possible if the Indica had not succeeded.*” Thus, IPRs support a successful innovation – the brand of Tata Indica in this case – which creates customer satisfaction and strong brand loyalty which promotes more innovations.

3.3 *Dhama INNOVATIONS®*

Kranthi Vistakula was a student at the Massachusetts Institute of Technology, USA. The Boston cold weather bothered Kranthi as he needed to put on and take off several layers of clothing, many times. While most people simply put up with such inconvenience, Kranthi had other ideas. He invented a technology to provide both heating and cooling on demand, made an international application for a patent entitled “apparel with heating and cooling capabilities” (WO/2008/103742; PCT/US2008/054438), returned to India in 2008, and founded *Dhama INNOVATIONS®* (Sharma 2013).

The company has been recognized as the *Top 100 Most Promising Technology Companies in Asia* and *Top 200 Most Promising Technology Companies in the Globe* by Red Herring in 2009. Dhama INNOVATIONS® received massive attention in the national media (Business Today 2013) as well as international media (Wall Street Journal 2013; Economist 2011; BBC 2011) for its pioneering contributions in technology and innovation.

Dhama INNOVATIONS® uses IPRs – patents, trademarks, and copyrights – to its advantage. Kranthi named his technology as ClimaCon®. ClimaCon® allows a user to control temperatures from 38 °F (4 °C) to 140 °F (60 °C) at the touch of a button. The thermal efficiency of ClimaCon® systems has been optimized through extensive human body thermal mapping research. This technology is energy efficient, noise-free, and green, as it does not employ harmful CFCs like other cooling systems.

Dhama INNOVATIONS® commercialized the following innovations (Market Watch.com 2013):

1. CLIMAWARE™ Cryothermic™ *Back Wraps*. It administers hot, cold, and contrast temperatures close to the spine, targeting the paraspinal region. It has spine-stabilizing supports to provide improved postural comfort. Its high-tension belt provides extra compression for superior relief due to enhanced thermal contact.
2. CLIMAWARE™ Cryothermic™ *Elbow Wraps, Knee Wraps, Migraine Wraps, and Wrist Wraps and Scarves*. These were built on the success of its predecessor, the CLIMAWARE™ Cryothermic™ *Back Wraps*.
3. CLIMAWARE™ Pronto-Heat™ *Jackets and Comet Cryothermic™ Coasters*. These innovations were born out of the success of the above.

Dhama INNOVATIONS® outsourced all its manufacturing to contractors and focuses just on innovation. According to Kranthi, the CEO of Dhama INNOVATIONS®, “We want to focus on what we are good at. We want to be like Google. Because Google also started by revolutionizing one field, online search, but is now into everything. We have revolutionized the heating and cooling in health-care and now we are looking at applications in other sectors such as the automobile industry” (Business Today 2013).

3.4 *Hindustan Unilever Limited (HUL)*

Hindustan Unilever Limited (HUL) is India's largest consumer products company with a heritage of over 80 years in India. It is a subsidiary of Unilever, with over 16,000 employees and annual sales of €49.8 billion in 2013. In 2015, HUL is rated 14th among the world's most innovative companies (Forbes 2015), and its recent achievements in the water purification area are noteworthy. HUL is an IPR-intensive company.

3.4.1 *Pureit*

Pureit is HUL's solution for India's pure drinking water needs. Pureit was developed by HUL at its Bangalore R&D center, patented (this was revoked later), test-marketed locally, and sold all over India. The biggest challenge for Pureit was how to win consumers. Though many companies sold water purifiers, market penetration was low due to high pricing. At the time HUL launched Pureit in India, Eureka Forbes had been selling the Aquaguard water purifier for more than a decade. Pureit was a disruptive business model innovation that combined performance and price: Firstly, Pureit did not need electricity. Secondly, Pureit was priced at Rs. 2350 – less than half the price of other entry-level purifiers.

HUL knew that providing safe drinking water at affordable price would not only bring in huge revenues but also would become a crown jewel in HUL's corporate social responsibility.

Unilever promised its Indian consumers that Pureit could make even filthy water fit to drink. One of Pureit's early ads featured a skeptic challenging Pureit salesperson to purify water collected in bottles from a dirty overhead tank, a pond, and rain. The commercial ends by showing the salesman dramatically purify the dirty water right before the challenger's eyes. For Indian consumers, this meant they didn't have to boil water to get pure drinking water.

While the lack of safe drinking water is a problem in many countries, each country has its own myths and traditions. Thus, Indonesians are more aware of the importance of clean drinking water but did not boil tap water, while Mexicans hesitated to drink purified tap water.

HUL found a way to offer the best water purification technology at a low price. Most water purifiers require electricity as they use reverse osmosis technology. Pureit purifies undrinkable water through a four-stage filtration process that meets the US EPA standards without electricity and makes pure drinking water available to poor people, which they either lack or can't afford. Further, Pureit warns the consumer when the filter is due for replacement and shuts itself off. Thus, it ensures that consumers never drink unsafe water.

Ultimately, Pureit's superior performance coupled with affordability helped to overcome consumer resistance. According to Bokey, Pureit's General Manager of Brand Development, "In Indonesia, we told consumers that the cost of Pureit was

16 times less than a 20-litre container of water,” and in Mexico, the message was, “The cost of a liter of packaged water is 60 times more than a liter of purified water by Pureit.” Today, Pureit is the world’s largest selling water purifier brand with a presence in nine countries, including Bangladesh, Brazil, Indonesia, Mexico, Nigeria, and Sri Lanka.

3.5 *Arvind Eye Care System*

Aravind Eye Care System is an Indian company that started in 1976 under the leadership of Dr. G. Venkata Swamy, known as Dr. V, with legendary reputation for low-cost high-quality healthcare and its innovative operational methods. It has about 3700 employees (including Aurolab), and its facilities include eight hospitals, 40 vision centers, and seven community eye clinics. To date, it has served over 32 million outpatients and performed four million surgeries.

Aurolab is an integral part of the Aravind Eye Care System (Business Today 2013). Aurolab has set itself a clear vision: “Eliminating needless blindness by making high quality ophthalmic products affordable and accessible to vision impaired worldwide.” Accordingly, it manufactures a wide range of high-quality ophthalmic consumables such as intraocular lenses, surgical sutures, pharmaceutical products, surgical blades, and equipment. Though it started with a focus on consumables in the ophthalmic segment, Aurolab has steadily diversified into adjacent market segments such as cardiovascular sutures, microsurgical hand sutures, antiseptics, disinfectant solutions, and spectacle cleaners.

Aurolab’s innovations and product development are driven by the needs of the Indian society for high-quality products at affordable prices. Aurolab products are manufactured according to strict quality assurance standards that comply with US FDA, EU GMP, and WHO GMP norms.

Before 1980, cataract surgery involved two steps: surgically removing the natural lens and giving patients spectacles. But by the mid-1980s, cataract surgeons preferred to use an artificial lens known as the intraocular lens (IOL) to replace the original eye lens to achieve near-normal vision. Unfortunately, multinational companies charged more than Rs. 3000 for a piece of IOL, which was beyond the reach of many poor people in India. This tremendously bothered Dr. V. “This went against the core philosophy of the group – same quality eye care irrespective of the patient’s social standing. He felt that the poor, for all the manual labor they did, needed intraocular lens more than others,” says Mr. Sriram, Director-Operations, Aurolab.

Dr. V was so determined to change this situation that he founded a company to manufacture IOL. Production began in 1992 and Aurolab achieved to bring down the price for a lens from Rs. 3000/piece to Rs. 270. One of the senior executives of the company summarized this in the best possible manner: “What we achieved then was a pricing innovation. We used the same material, same machine, same process and same quality parameters. We just capped the price at Rs 270, which was a tenth

of the international price and we still made some money.” Today, the same lens is priced at Rs 80. This drop in IOL prices led to a big leap in cataract surgeries in India. Before the affordable IOL hit the market, eye surgeons performed 1,000,000 cataract surgeries a year. Today, that number is at 7,000,000. In the minds and hearts of the people of India, Aurolab thus became a brand that really cared for the poor people.

Aurolab continued its innovations further. As the technology evolved, a foldable IOL emerged. Aurolab tried to buy the technology for a *hydrophilic* foldable lens, which could be stored in water, but found that it would be unaffordable. It later developed this lens in 2001. However, Aurolab faced an even greater challenge with the *hydrophobic* foldable lens, which didn’t need storage in water and was flexible even under dry conditions. Others made this lens with a patented special material. After doing R&D for 3 years, Aurolab developed its own material to make the *hydrophobic* foldable lens, without infringing on the original patent. Today, Aurolab is one of the elite companies in the world possessing this technology and in the process of applying for a patent. According to Mr. Prasad, executive in charge of Aurolab international marketing, “We did face challenges, especially when it came to the availability of technology. We overcame it and today we can confidently say that if there is one field where India has beat China when it comes to manufacturing, it is in intraocular lens production.” Thus, the eye care in India has changed in the late 1990s since Aurolab made several innovations to marketplace. Since then, Aurolab exported its eye care products to 130 countries worldwide, with an eye on the poor people in markets like Africa, Latin America, Central America, and Southeast Asia. Aurolab is now getting ready for *reverse innovation* – marketing its products to industrially advanced countries (Govindarajan and Trimble 2010).

Aurolab has also taken corporate social responsibility to a different level, by contributing about 60 % of its total sales to nonprofit organizations. According to the head of a global NGO which fights blindness, “Governments in Colombia, Argentina, Sudan, Nepal and many more countries use their health care budgets more effectively by opting for low-cost high quality Aurolab products instead of those supplied by multinational companies and thus serve a larger mass of needy people.”

3.6 *FINO PayTech Ltd.*

FINO PayTech Ltd. is a financial services company founded in Mumbai, India, in 2006. FINO stands for Financial Inclusion Network & Operations. It is owned by a collection of institutional investors (public and private) from within and outside India, who are entrepreneurial. It employs over 2500 employees and has 20,000 business correspondent agents spread across 239 offices (Business Standard 2011). FINO’s unique value proposition is that it is an alternate banking channel that serves the financial needs of ignored and underserved customers through innovative

end-to-end sourcing and servicing solutions (Gupta 2014). Further, FINO is a pioneer in innovative technology solutions for institutions like banks, micro-finance institutions, government entities, and insurance companies.

FINO PayTech Ltd.'s differentiation is rooted in a combination of low-cost technology and efficient delivery channel. FINO's vision is: "To be the universally preferred choice of customers by fulfilling all financial service needs." According to FINO, "Our business model derives its strength from the robust in-house technology, versatility of operations, scale of the channel and customer know-how. The challenges of serviceability and scalability of the traditional banking channels have been addressed by way of innovation. In 7 years, we have touched the lives of over 78 million customers through over 28,000 transaction points in 499 districts across 28 states in India (FINO – <http://www.finopaytech.com/media-lounge/fino-paytech-in-media>)."

FINO innovated a novel concept of banking (known as "doorstep banking") using its wide network of more than 20,000 business correspondents – taking the financial services to people (especially the rural poor) who otherwise cannot visit a bank or afford to bank (Business Today 2013). To achieve this, FINO introduced its clients and customers to a GPRS-enabled handheld device, known as a Point of Transaction (POT), which uses integrated biometric/smart card (known as the *Aadhar Card*). The transaction starts simply by FINO business correspondent getting the customer to place his/her thumb on the POT device screen and keying in their Aadhar Card identification numbers. Next, POT communicates the customer information to FINO's server, which, in turn, conveys the same to the client's server. Customers receive their money from the clients and the transaction details are recorded on a real-time basis.

Today, FINO PayTech Ltd. is credited with innovating branchless-banking infrastructure in India. According to the Reserve Bank of India (RBI), 58.7 % of households in India use banks. RBI data further shows that doorstep banking accounts have increased banking fivefold in the last 3 years to 67.7 million accounts. According to FINO's spokesperson, it had enrolled 40 million people for savings accounts by the end of 2012–2013, giving it a market share of about 60 %. Rajeev Arora, Director of Technology & Central Operations at FINO, says, "FINO's decision to create its own applications has not only led to cost savings, but also enhanced its competitiveness" (Business Today 2013).

Fueled by its recognition and success in India, FINO is making efforts to promote its business model innovation to other neighboring markets, such as Nepal, Bangladesh, Tanzania, and Nigeria. To start with, FINO has been helping people residing in inaccessible places in Nepal, with banking services for the past 3 years. FINO provides a full package of services when it sells its product in Nepal, where its clients are Bank of Kathmandu and Everest. FINO stores all its Nepal transaction data on the Indian servers and monitors the transactions between its customers, business correspondents, and clients.

According to Pravin Chhetri, the CEO of Bank of Kathmandu, his bank had used FINO's business methodology to open 200 accounts, where people transact about 2–3 times a month. While the number may be small, it is significant in Nepal where only 10–11 % of the population engages in banking. "We have to wait for at least

5 years. Until then, it is a cost for us,” says Chhetri (Business Today 2013). Thus, FINO Nepal has long-term goals. Aurora believes that FINO’s expansion into other markets hinges upon government policies in those nations. For example, financial regulators in Africa do not want data from local transactions to leave their country and stored in FINO’s India-based servers. Therefore, FINO needs to adapt and build its organizational infrastructure in Africa.

3.7 *Narayana Health*

This company was previously known as Narayana Hrudayalaya. Today, it is known as Narayana Health (NH). Narayana Health is one of the largest and the most economical healthcare service providers in the world. NH’s ability to provide the highest-quality medical care on large scale at affordable prices while achieving sustainable profitability is winning recognition as a new business model innovation.

In India, millions of poor people lack accessibility to good healthcare, while the rich have access to the most sophisticated, super-specialty services. Dr. Devi Shetty founded NH and brought about a healthcare revolution in India by making the highest-quality healthcare (including the super-specialties) affordable to masses while still making sustainable profit ((Business Today 2014).

NH humbly began in 2001 as a 225-bed hospital in Bangalore, India. Today, NH has grown into a 7500-bed healthcare conglomerate, with 29 hospitals in 17 cities across India. NH’s own website states what they do best: “Equipped with all super-specialty and tertiary care facilities that the medical world has to offer, NH is now a one-stop destination for any healthcare requirement a common man needs. It may be noted that the affluent come here for the world’s best healthcare and the poor come here for the focused attention they can get from a private hospital. No one is refused treatment due to lack of funds.”

NH hospitals perform 150 major surgeries every day and attend to 4200 outpatient department (OPD) patients/month. They offer super-specialty tertiary care facilities in several specialization areas including cardiac surgery, cardiology, gastroenterology, vascular, endovascular services, nephrology, urology, neurology, neurosurgery, pediatrics, obstetrics and gynecology, psychiatry, diabetes, endocrinology, cosmetic surgery and rehabilitation, solid organ transplants for kidney, liver, heart and bone marrow, and, of course, general medicine. In addition, NH has oncology services for most types of cancer including head, neck, breast, cervical, lung, and gastrointestinal.

NH has been able to achieve all of this by bringing the cost of surgery down. According to Govindarajan and Trimble (Govindarajan and Trimble 2012), Tuck School of Business, Dartmouth College, USA, “NH’s average cost of a bypass surgery is \$1500 (Rs. 90,000) compared to \$144,000 in the US, \$27,000 in Mexico and \$14,800 in Colombia. Interestingly, NH’s own cardiac surgery costs have come down compared to what they were 13 years ago. However, NH didn’t achieve lower cost at the expense of quality.” Dr. Shetty points out, “NH’s mortality rate (1.27 %)

and infection rate (1 %) for a coronary artery bypass graft procedure is comparable to any US hospitals. Incidence of bedsores after a cardiac surgery is globally anywhere from 8 to 40 %. At NH, it has been almost zero in the last four years.”

The focus on both cost and quality has not hurt NH’s financials either. While NH’s revenues grew by over 200 % in the last 5 years to Rs. 827.35 crores in 2012/2013, its earnings before interest, taxes, depreciation, and amortization (EBITDA) at Rs. 97.79 crores (13 % margin). It is not surprising, therefore, that JP Morgan and PineBridge have picked up a 24 % stake in NH. They clearly believe NH is creating long-term value for investors.

NH’s innovation success is grounded in a variety of factors:

1. *Clarity and commitment to vision.* NH believes that it must provide affordable, high-tech, high-quality healthcare to all, irrespective of social status or ability to pay. All doctors, nurses, and medical staff at NH are wedded to this vision.
2. *Leveraging economies of scale.* NH has large hospitals and attracts a large volume of patients through innovative schemes such as micro-insurance and telemedicine. This significantly cuts down NH’s unit cost per surgery. According to Dr. Govindarajan, “When you perform open heart surgery on an assembly line, not only does cost go down, but quality goes up. Performing a medical procedure repeatedly improves a doctor’s skill and reduces errors.” (Business Today 2014)
3. *Achieving operational excellence.* At NH, surgeries are done by high-performance teams. Each team has a specialist, junior doctors, trainees, nurses, and a paramedical staff with highly streamlined roles and procedures. Typically, at NH’s Bangalore facility, a surgeon performs, on average, 4 surgeries/day 6 days/week, or 24 surgeries/week. This number is much higher than at any hospital globally, and that dramatically reduces cost. Also, NH manages to decrease its capital costs by leasing and not buying equipment wherever possible. Strong emphasis is also placed on equipment maintenance. Further, buildings are also designed to keep costs low. For instance, NH’s Mysore Hospital was built at Rs. 18 lakhs/bed, while a comparable hospital normally costs 3–9 times higher.
4. *Deploying enterprise resource planning (ERP) on the cloud rather than setting up data centers.*
5. *Data mining to raise quality of the surgeries and efficiency of staff and operations.*

Thus, the NH *service mark* gained the trust, loyalty, and goodwill of the people of India as it values patients before profits. Fueled by this success, NH is promoting *reverse innovation*, making efforts to replicate its innovation model in the West.

3.8 *Bharti Enterprises*

Bharti Enterprises was founded in 1976 by an innovative entrepreneur, [Sunil Bharti Mittal](#). It is a US\$16.5 billion Indian business [conglomerate](#) headquartered in [New Delhi](#), India (BHARTI – <http://www.bharti.com/hom>).

Bharti started from humble beginning as a manufacturer of bicycle parts. Since then, Bharti innovatively built a variety of highly successful businesses in telecommunications, retail, real estate, financial services, and manufacturing. Today, Bharti is one of the largest and most respected business groups (brands) in the world. It includes successful business divisions such as Bharti Airtel (Bharti Airtel [2013](#)), Bharti AXA General Insurance, Bharti AXA Life Insurance, Bharti Retail, Bharti Realty Limited, FieldFresh Foods, and more.

Bharti Airtel started its telecom service business in India in 1995, by launching mobile services. Since then Airtel became Bharti group's flagship company and went on to become one of the top four wireless service providers in the world, in terms of subscribers.

Bharti Airtel's goal was to offer point-to-point mobile telecom service significantly cheaper than competition. In the telecom industry, entry barriers are high. That is because capacity must be built ahead of demand, which meant that new entrant must absorb the cost of unused capacity. Airtel realized that it would not be possible to create a telecom revolution in India without building a low-cost business model. Bharti Airtel came up with an innovative business model to accomplish its goal: to build the Airtel brand based on real insights into the customer requirements, to forge partnerships with external experts, to build and manage company's telecom and IT network using external expert partners, to lower investment costs and risks, and to reap higher returns on investment. Accordingly, it built win-win partnerships with leading global equipment vendors and service providers such as Ericsson, Nokia, and Siemens to build and manage telecom network and IBM to build and manage the IT network. Airtel was able to convert fixed costs into variable costs as the vendors for telecom network did not bill for the equipment but charged only for the utilized capacity. Thus, Airtel was able to lower its costs and mitigate risks while ensuring high-quality service to customers.

By changing the paradigm of telecom infrastructure, Airtel was able to create new value-added services on the mobile platform. Today, "Music Bharti" is the largest music company in India, though Airtel is not a music producer, just like Amazon is the world's largest bookstore though it does not publish books. Thus, Airtel created another stream of revenue for itself by distributing music via caller ring-back tones, mobile radio, and music on demand.

With well over 200 million subscribers, Bharti Airtel is the second largest Asian (India does not border the Pacific) mobile operator by subscriber base, behind [China Mobile](#). Further, Airtel may be the world's cheapest mobile telecom service at \$0.01 to \$0.05 per minute. Despite its low pricing, Bharti Airtel achieved 120 % compound annual growth rate (CAGR) in sales revenues and 282 % growth in

net profits from 2003 to 2010. In 2015, its market capitalization stands at approximately US \$237 billion.

Not surprisingly, Bharti Airtel today is the leading global telecommunications company with operations in many countries, including India, Sri Lanka, Bangladesh, Seychelles, Burkina Faso, Chad, Congo Brazzaville, Democratic Republic of Congo, Gabon, Ghana, Kenya, Madagascar, Malawi, Niger, Nigeria, Rwanda, Sierra Leone, Tanzania, Uganda, and Zambia. In addition, the group also has mobile operations in Jersey and Guernsey. In India, Airtel's offerings include 2G, 3G, and 4G wireless services, mobile commerce, fixed line services, high-speed DSL broadband, IPTV, and direct to home (DTH) and enterprise services including national and international long-distance services to carriers. In the rest of the world, it offers 2G and 3G wireless services and mobile commerce.

Finally, the competitive advantage of Bharti lies in its ability to build win-win partnerships with some of the largest multinational companies in the world: Thus, for telecommunications, SingTel, Qatar Foundation Endowment, IBM, Ericsson, Nokia Siemens Network, and Alcatel-Lucent are the partners; for the insurance business, the AXA Group is the partner; and for processed foods, a Division of Del Monte Pacific is the partner.

Propelled by the success of Airtel, Bharti Enterprises has been innovating its way into other businesses. Thus, Bharti has entered into a variety of businesses including retail, real estate, life insurance, general insurance, and fresh and processed foods. Bharti's innovations for sustainable growth and competitive advantage continue.

3.9 *Darjeeling Tea*

Darjeeling tea is grown in the Darjeeling district of West Bengal, India (Darjeeling Tea – <http://darjeeling.gov.in/darj-tea.html>). In 2005, it was the first Indian product of any kind to receive the GI tag from the Indian Patent Office. Darjeeling tea markets itself in four different varieties – black, green, white, and oolong. Darjeeling tea yields, upon brewing, a thin-bodied, light-colored, floral aroma concoction. Its flavor may include a dash of biting tannic characteristics and a musky spiciness sometimes described as “muscatel.” Darjeeling tea is mostly made from small-leaved Chinese varieties. Although Darjeeling teas are sold as “black teas,” technically they are more oolong than black, due to partial oxidation. Motivated by commercial success, Darjeeling tea is embarking on oolong and green teas, and they are gradually gaining market share, and an increasing number of tea plantations are beginning to produce *white teas*.

In recent years, consumers have been growing skeptical about the authenticity of Darjeeling tea as the global tea trade itself has been witnessing adulteration and forgery. Thus, while approximately 10 million kg/year of Darjeeling tea is being produced in India, global tea markets have been trading the brand at 40 million kg/year (Rediff.com 2007). To reverse this situation, the [Tea Board of India](#) has been actively administering the Darjeeling certification mark and logo. Thus, the

Tea Board of India prohibits Darjeeling tea to be cultivated/manufactured anywhere else in the world except in Darjeeling, India, a GI restriction similar to the EU protections for [Champagne](#) and [Jamón ibérico](#) (Tea Board of India – <http://www.teaboard.gov.in/index.asp>).

3.10 Kanchipuram Silk Sarees

This is a famous brand of traditional [Indian](#) silk *sarees* made by the weavers from *Kanchipuram* (also known as *Kanjevaram*) located in Tamil Nadu, India. These are naturally woven silk *sarees*. *Kanchipuram Silk Sarees* are well known for high-quality and beautiful original designs with wide contrasting borders. The cost of a Kanchipuram saree varies depending upon the intricacy of work, colors, pattern, and material used like zari, gold thread, etc. and can reach up to US\$ 1500 or even more. Since 2005, *Kanchipuram Silk* has been protected by a *GI label* in India, certifying its origin (Subramani 2010).

From September 2003 till today, the Indian GI Registry has 235 products (Indian GI Registry, March 2015). According to Mr. Sanjai Gandhi, an IPR attorney, “No one else can unfairly exploit the tag. Only their products would be called ‘Kanchipuram silk sarees’ and they would come with an authentic ‘GI’ tag. If others use this Unique Selling Proposition (USP), they are liable for prosecution.” Thus, the Kanchipuram Silk Sarees is the first GI in India to actually implement the security protocol, which awards jail sentences and fines to violators of the GI laws.

4 Summary and Conclusions

In summary, our research makes the following preliminary findings:

Firstly, there is confusion between the concepts of invention and innovation in the literature, and we find that these terms are sometimes used interchangeably. This needs clarification. According to our definition, invention demonstrates *potential value* of an idea (technological or business model), whereas innovation achieves *tangible value* by implementing an invention into a commercial reality. However, inventions made without proper commercial understanding fail to generate business interest and will not lead to innovations. Therefore, IPRs protecting such inventions whose business relevance remains unclear will *NOT* promote innovation. Indeed, a significant number of the technical inventions reported in the literature may fall under this category. Consequently, *using the efficiency of patent conversion to commercialization as a measure for IPR promotion of innovation leads to incorrect conclusions*. On the other hand, IPRs protecting business-focused inventions promote innovation.

Secondly, innovations may not always be commercially successful. In fact, many of them fail commercially, due to reasons such as stronger competition, inadequate understanding of the customer/consumer needs/wants, regulatory

challenges, poor marketing, supply chain disruptions, and changes in macroeconomic conditions, to mention a few. Innovations that are commercially successful generate value. It is important to note that only those IPRs that protect successful innovations and are aligned with the vision and strategy of the firm would be able to support growth and offer sustainable competitive advantage to the firm. Thus, only such IPRs can create a win-win for the firm as well as its customers/consumers by enabling the former recover its R&D investments while ensuring the latter with superior products/services. In turn, this will help the firm to build customer loyalty and strengthen its reputation for innovation in the marketplace.

IPRs protecting inventions that are of no commercial interest to a firm could still be important to another firm. Therefore, companies holding big portfolios of IPRs must do periodic and effective intellectual asset management vis-à-vis their vision and strategy to determine the IPRs that can be licensed/sold to other firms to generate alternative streams of revenue. Thus, such IPRs could be of *economic value* to the firm, though they are of no commercial interest (Evenson 1990).

The ESA-USPTO Study from the USA reported strong evidence for how IPRs protecting innovations help to promote innovation, growth (as shown by creation of employment, improvement of wages, and growth in GDP), and competitive advantage. In line with the above conclusions, the OHIM-EPO Study from the European Union also reported unequivocal evidence for how IPRs have a positive impact on employment, wages, trade, and GDP overall, thus catalyzing more innovation.

In addition, the examples we have examined both from the USA and India – including the Gillette Company, Tata Motors, Dhama INNOVATIONS®, Hindustan Unilever Limited (HUL), Aravind Eye Care System, FINO PayTech Ltd., Narayana Heath, Bharti Enterprises, Darjeeling Tea, and Kanchipuram Silk Sarees – show how various IPRs protecting successful innovations promote more innovation. To sum up, IPRs protecting successful innovations achieve a number of objectives: boost the firm's intellectual capital; enable the firm to recover its R&D costs; support products to succeed better in the marketplace; ward off competition; help achieve sustainable revenues, profits, and market share; improve investor confidence; increase market capitalization; attract investments; set up expectations of higher rates of return; and catalyze more innovations.

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