



Practitioner's Section

Unbiased Insight on Biopharma's Innovation Crisis



Enrique Esteban, Frank Lien, Richard Youn*

Bogart Delafield Ferrier LLC, 91 Washington Street, Morristown, NJ 07960, USA.

* corresponding author: ryoun@bdf.com

The pharmaceutical industry is at a crossroads. In 2010, it faces one of the biggest waves of proprietary patent expirations yet lacks a viable pipeline to replace these soon to be generics. Furthermore, R&D expenditures have more than doubled from 1995 to 2006 without commensurate increase in NMEs (new molecular entities, Martinez and Goldstein, 2007). In 2007, the FDA (Food and Drug Administration) only approved 19 novel drugs, the lowest number since 1983 (Blum, 2008).

At this critical juncture, pharma would benefit immensely from a dose of "new thinking" and "expert insight" on ways to reinvigorate its innovation model within R&D. The authors assert that there is much to learn from the pro-

blems and successes of non-pharma peers, who at one point faced a similar crisis, that of incremental innovation and falling new product introductions. Their stories offer the pharmaceutical industry an invaluable perspective that will shed light on pharma's own case for re-thinking its approach to drug discovery and development.

What follows are eight mini-cases, each one representing a distinct non-life science industry corporation, and the programs they initiated to reinvigorate their product development efforts:

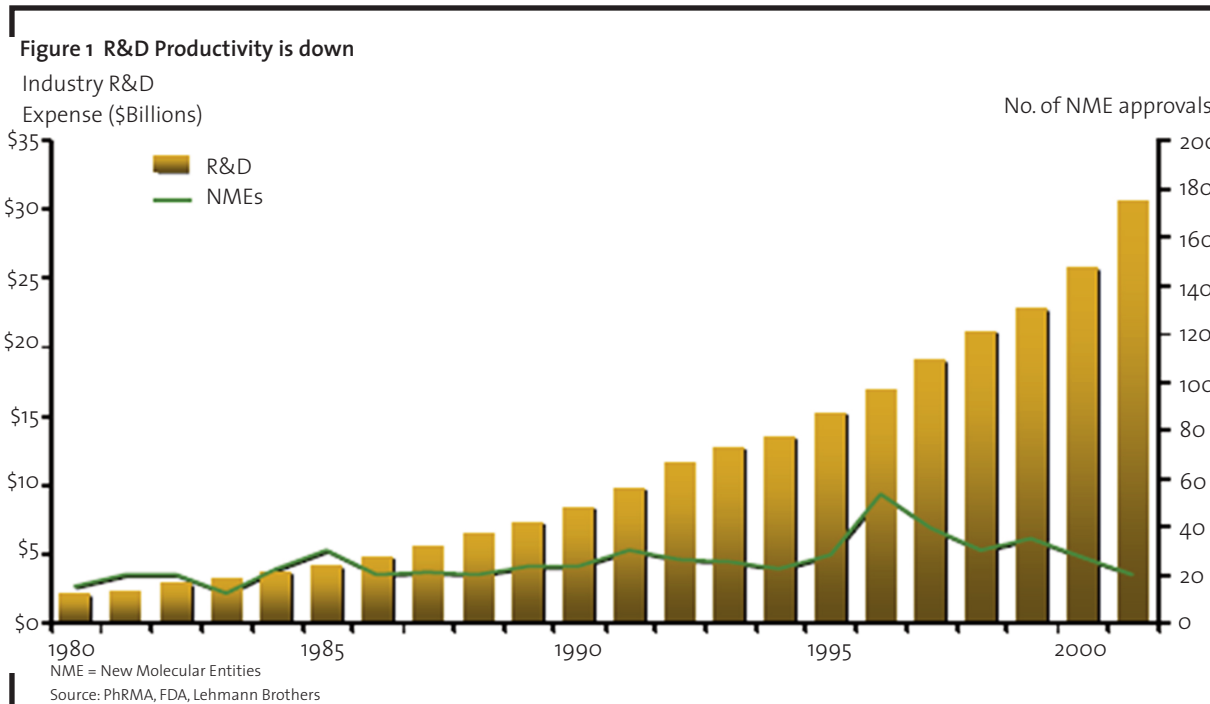


Figure 2 Motorola's Revenue 2001-2005

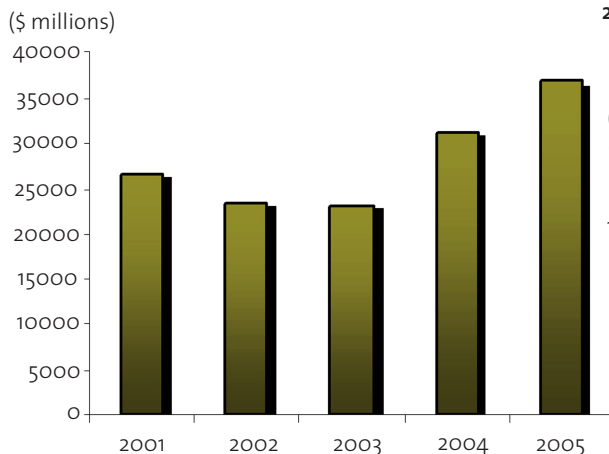
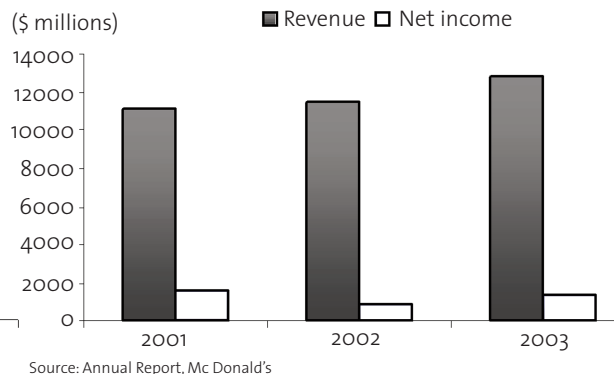


Figure 3 Mc Donald's Total Revenue and Net Income 2001-2003



Motorola

Change Implemented: Appointed, empowered, and made a manager accountable for each product development program.

"Although world-renowned as a leader in quality control, Motorola insiders believed stringent processes, although critical to maintaining quality and monitoring costs, stifled the company's innovation process."

Motorola's turnaround, from producer of unappealing mobile phones to the creator of the "iconic" RAZR phone was facilitated by drastic change in product development decision making.

The pioneer of mobile phones that once dominated the communications industry fell upon difficult times when competitors such as Nokia, Samsung and LG entered the market offering products with greater consumer appeal. Although world-renowned as a leader in quality control, Motorola insiders believed stringent processes, although critical to maintaining quality and monitoring costs, stifled the company's innovation process. The main culprit: Motorola's consensus based decision-making process utilized to develop a new phone; a process in which representatives from each major region were required to establish a position on a new product concept. "The regions would request the sorts of features and functions they wanted included in the design. Each region would then forecast how many units of the model they thought they could sell. The aggregated regional plans would help Motorola decide whether to invest in a phone's introducti-

on" (Anthony, 2005). Although it provided consensus amongst all the regions, it was time-consuming, cumbersome, and ultimately produced products that lacked any consumer appeal.

Incoming CEO, Ed Zander (2004), dramatically altered this decision-making process by transforming the organizational structure of new product development teams by empowering decision making to its managers. The results were simplified decision making, faster project cycle turn-around times, and accelerated go/no-go project decision making (Shinn, 2007).

The culmination of these efforts was birthed in the RAZR phone, "iconic" and "hip", shattering Motorola's stodgy product image. At its introduction, the RAZR was the world's slimmest phone with enhanced features such as a camera and internet capabilities. Over one million units were sold during its first six months on the market (Anthony, 2005).

McDonald's

Change Implemented: Refocused on the customer experience

"...change occurred only after [McDonald's] returned to its roots of providing the best experience for its customers."

McDonald's reclaimed the title of the world's largest fast food restaurant chain after it returned to its roots, to provide the best possible experience for its customers.

Same-store sales experienced a sharp decline in early 2003, resulting from failure to fulfill important McDonald's processes, such as "full-field" evaluation standards (Tilson, 2003). The failure to ensure cleanliness, quality and consistency, resulted in a negative "McDonald's" customer experience. Furthermore, McDonald's ignored the market's shifting tastes toward a greater emphasis on "healthier" fast food selections. At the end of first quarter 2003, McDonald's announced its first-ever quarterly loss (Horovitz, 2004).

Newly appointed CEO, Jim Cantalupo, initiated "Plan to Win" (BusinessWeek, 2007). The program scaled back opening of new restaurants, required better service from its employees, and introduced new and healthier menu items (Gibson and Grey, 2004). McDonald's also slashed capital spending by 40% while addressing mounting customer complaints by speeding up drive-thru service and ensuring surly employees were disciplined (Gibson and Grey, 2004). Food studios were developed in the different regions served by McDonald's to create products that focused on meeting regional-specific consumer demands.

Eleven months after Cantalupo took charge, "Plan to Win" brought customers back into McDonald's restaurants and delivered impressive results: 2003 net income rose to \$1.471 billion from \$893.5 million (Gibson and Grey, 2004); system-wide sales increased 11.1% in September of the same year; and same store sales increased by 10% (Tilson, 2003).

Apple

Change Implemented: Eliminated "silo mentality" within R&D. Consolidate all R&D functions into one product development group accountable to one manager. Better understood and focused on customer experience.

"Jobs reorganized R&D into product groups that included in them all the functional areas needed to deliver on the consumer's product experience. They were accountable to one manager."

Apple's reemergence as the global innovator of computer products occurred once its original founder, Steve Jobs, returned as CEO. Prior to his return, Apple suffered from senior management missteps that included investing heavily on ill-fated projects and repeated large-scale funding on dead-end projects. Pro-

fits began to erode and by 1995 Apple's once 9% market share declined to 7.4% and it suffered a \$69 million loss in the fourth quarter of 1994 (Hormby, 2006).

Jobs returned to Apple in 1997 and instituted drastic change. He made significant cuts in Apple's product portfolio, discontinued products that were underperforming (Linzmayr and Chaffin, 2005) and opted for a streamlined product offering of products he believed to be highly innovative. Jobs also restructured his product development organization, which, until his return, was divided into highly-siloed functional groups that did not work cohesively. He dismantled these disparate functional groups and integrated them into separate product (iPod, iMac, etc.) development groups which all reported to one manager. Designers, hardware and software engineers, and manufacturers, all worked to seamlessly integrate every aspect of a product's functionality that captivated the complete user experience (Grossmann, 2005). The reorganization has produced groundbreaking products such as the iPod, iPhone, and iMac.

Although the company launches fewer new products today and only spends 4% of revenue on R&D (Wolverton, 2006), its revenues in fiscal year 2007 stood at \$24 billion, a 348% increase since fiscal year end 2001, the year the iPod was launched. Apple ended fiscal year 2007 with \$15 billion in cash and zero debt (Apple Inc., 2007). As of January 2007 the iPod garnered 73% market share of mp3 players sold globally (Wikipedia, 2008).

Walt Disney

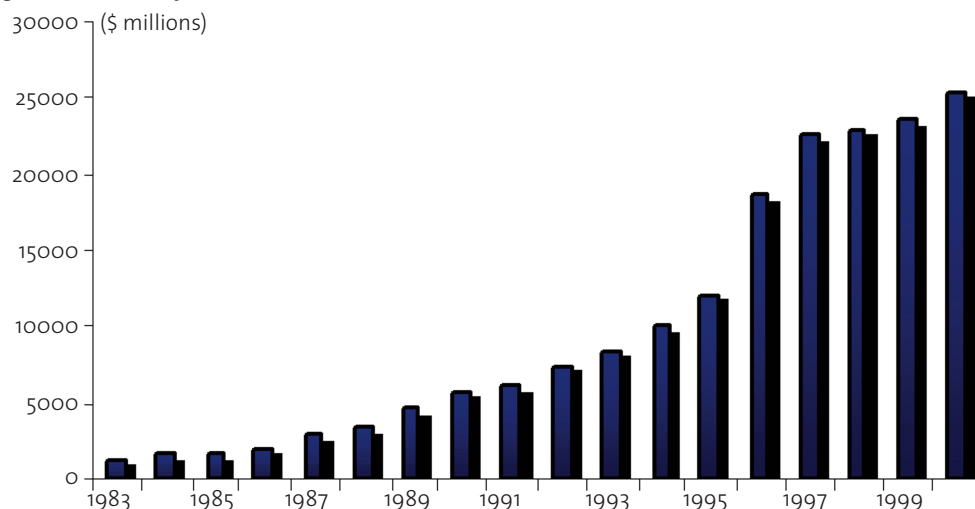
Change Implemented: Nurtured and leveraged corporate synergies while preserving corporate values

"[Michael Eisner] managed the ambitious turnaround by leveraging Disney's brand and nurtured creativity by accessing previously untapped corporate synergies."

Following serious declines in profits after the death of its creator, Walt Disney in 1966, CEO Michael Eisner transformed Walt Disney Inc. into the world's largest entertainment empire (Weber, 1998).

As the chief source of creative efforts within Walt Disney Inc., the death of Mr. Disney took a significant toll on the quality and depth of the company's product pipeline. When Eisner

Figure 4 Walt Disney's Revenue 1983-2000



Source: Annual Report, Walt Disney

assumed the role of CEO in 1984, Disney's box office shares were a paltry 4%, the lowest amongst all major studios (Walt Disney Inc., 1984).

Eisner steered the ambitious turnaround by leveraging Disney's brand and nurtured creativity by accessing previously untapped corporate synergies. His turnaround revolved around building Disney's brand while preserving the corporate values of "quality, creativity, entrepreneurship, and teamwork" (Rukstad and Collins, 2005). To achieve this, Eisner centralized many corporate functions, such as corporate marketing, engendering important synergies within Disney. Corporate wide strategic planning events were jointly coordinated by senior management, bringing departments together to generate novel ideas. The results from these ideation exercises were then coordinated by a corporate events department, designed specifically to disseminate "Disney synergies" enabling each strategic business unit to benefit from each other and bolster lagging units. Eisner cultivated creativity using Disney's most vital corporate skill, "managing creativity". He fostered expansive and innovative ideas by readily approving spending in concept-generation, while expecting business units to deliver against well-defined strategic and financial objectives, pitting creative and financial forces against each other as each business developed its market position. With corporate synergies and creative management processes in place, Eisner was able to ramp up movie production from two per year in 1984 to 15 to 18 per year four years later. During this

period animation movie production was also expanded to a new animated feature every 12 to 18 months instead of one every two years (Rukstad and Collins, 2005).

Eisner's turnaround efforts raised revenue from \$1.65 billion in 1984 to \$25 billion by 2000 and net earnings rose from \$0.1 billion to \$1.2 billion during his first 15 years, generating a 27% annual total return to shareholders during this period (La Franco, 1999). He exceeded his original promise of generating at least 20% annual shareholder returns and also managed one of the greatest corporate turnarounds in history.

Procter & Gamble

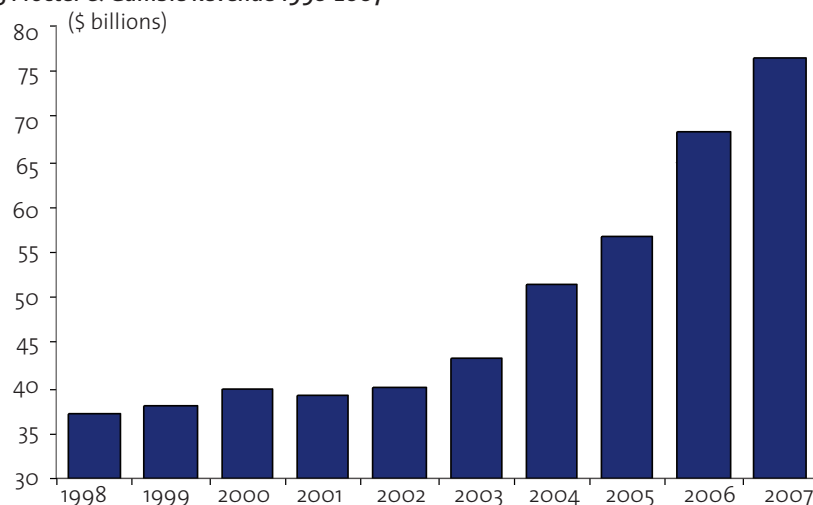
Change Implemented: Sourced innovation wherever it can be accessed; internally and externally

"New leadership immediately recognized the need to restructure their R&D organization and the "Connect and Develop" innovation model was established."

Procter & Gamble reinvigorated new product development and engendered growth by transforming their R&D organization and implementing a novel innovation strategy in "Connect & Develop".

P&G traditionally based much of its success on new product innovation and its deep understanding of consumer needs through its pioneering market research activities which studied consumer preferences and buying habits

Figure 5 Procter & Gamble Revenue 1998-2007



Source: Annual Report, Procter & Gamble

(Procter & Gamble, 2007). By 2000, the company was facing a crisis, their internally focused innovation model was producing flat product success rates of 35%, resulting in a pipeline too weak to sustain its expected 4% annual growth rate (Huston and Sakkab, 2006). P&G saw their sales growth rate flatten over a four year span beginning in 1999 and their stock price dropped by more than 50% in 2000 alone (Huston and Sakkab, 2006).

Facing this situation, newly appointed CEO A.G. Lafley and CTO G. Gil Cloyd, placed P&G under new direction called "Job One", to return P&G to historical dominance in product development and improve sales growth rates above the industry average (Colvin, 2006). The new leadership immediately recognized the need to restructure their R&D organization and the "Connect and Develop" innovation model was established. The "Connect and Develop" model enabled P&G to become more connected internally by enabling technologies and ideas to move more easily across existing business units, more unique and invaluable was P&G's new found ability to gain an intimate understanding of consumer needs and access to innovators outside the company through a much larger network of both proprietary and non-proprietary relationships.

The model effectively increased P&G's R&D staff from 7,500 internal members to include an estimated 1.5 million external staff members. As a result, R&D productivity has since risen 60% and over 35% of all new products commercialized have been developed externally. Internal innovation success rates have

doubled, total sales has grown 90% from 2002 to 2007, and their stock price has doubled since 2000 (Huston and Sakkab, 2006).

3M

Change Implemented: Applied discipline, focus, and accountability to the innovation process

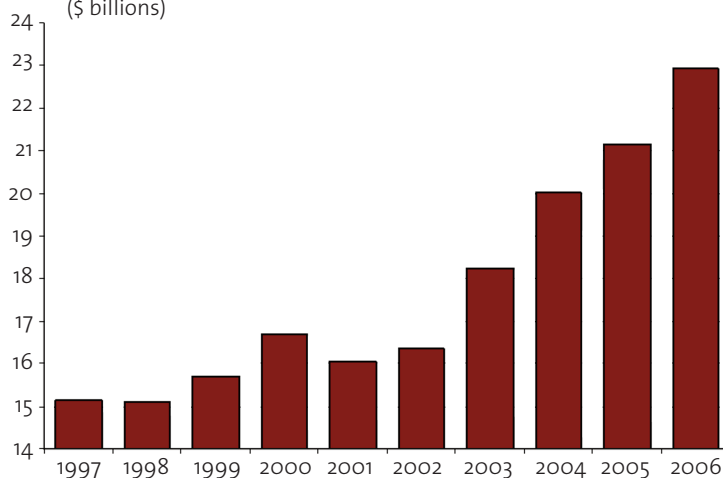
"The focus was not to just survive in existing product niches but to continue to innovate and develop new ideas."

3M transformed their product development organization by instituting Six Sigma discipline to overcome slower new product introductions and sales growth.

3M corporate image has long been built on innovative and unique products, constantly seeking to fill unmet product niches by devoting up to 25% of sales to new product development (3M, 2002). This intense focus on innovation enabled 3M to create such groundbreaking products as Scotch® tape and Post-It® notes which contributed to the company's healthy topline growth.

In the late 1990s, 3M's stock price began to stagnate as competition grew in its traditional product niches and number of new product introductions slowed (BusinessWeek, 2004; Funding Universe, 2007). Although 35% of revenues generated in 2000 were attributed to products introduced within the past four years, 3M had not produced a blockbuster product since the introduction of the Post-It® note in

Figure 6 3M Revenue 1997-2006
(\$ billions)



Source: Annual Report, 3M

1980. By the late 1990s both revenues and profits were declining as a result of fierce competition from lower priced substitutes (Funding Universe, 2007).

New CEO, Jim McNerney, arrived in 2001, and as his first order of business, instituted Six Sigma practices to cut costs and streamline product development efforts resulting in layoffs of over 6% of the workforce (Funding Universe, 2007). Utilizing Six Sigma, McNerney sought to bring discipline and focus to the R&D organization - the focus was not to be more competitive in existing product niches but to continue to innovate and develop new ideas by transforming 3M into a nimbler and leaner innovative corporation (Arndt and Brady, 2004). R&D was consolidated by closing fourteen technology centers, transferring staff to a newly formed Corporate Research Laboratory or to the company's 40 divisions and funds were channeled programs that exhibited a higher probability of potential success instead of access to equal funding across-the-board (Funding Universe, 2007). Furthermore, researchers were pushed to work more closely with marketing to transform existing in-house technologies into commercial products in order to stay ahead of their competitors (Arndt and Brady, 2004).

The R&D reorganization efforts delivered profit growth of 22% per year while McNerney was CEO and increased operating margins from 17% in 2001 to 23% in 2005 (Arndt and Brady, 2004).

Cadillac

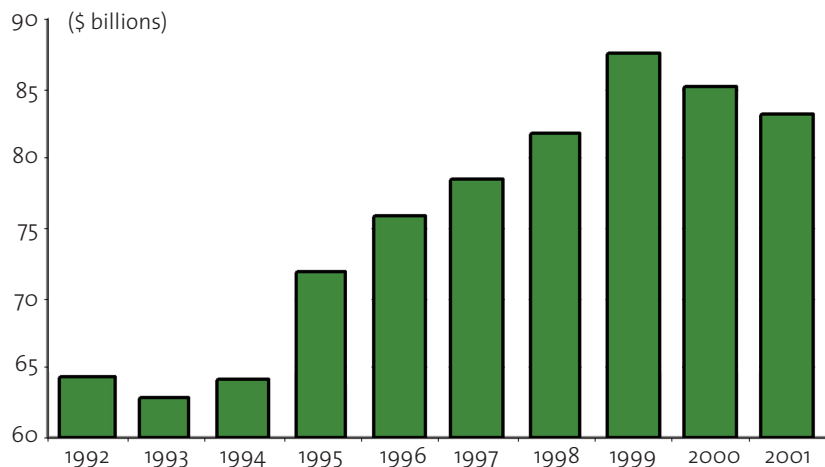
Change Implemented: Embraced risk and tolerance for failure as a key requirement for innovation process to succeed

"The success of "art and science" can not be measured in sales, which have been slow to respond, but by the reinvigorated reputation and brand image."

Cadillac's willingness to take an "all or nothing" attitude towards the complete overhaul and redesign of its fleet enabled the company to reestablish its reputation and brand as the icon of American automobile industry. Soon after World War II, Cadillac was viewed as the classic American automobile - superior and innovative engineering coupled with distinctive style and high performance (Lamm, 2002). The early 1980s saw the backlash towards Cadillac reach its peak as rising fuel costs and demands on better fuel economy hurt Cadillac's sales (Welch and Khermouch, 2002). In response to changing consumer demands, Cadillac decided to downsize vehicles and utilize platform cross-sharing with other GM brands, resulting in loss of build quality, brand identity, and lower sales. Although these quality issues were resolved long ago, the damage done to its brand image was enormous.

In the late 1990s, senior management at General Motors, owner of the Cadillac brand, became serious about saving the fallen icon (Welch and Khermouch, 2002). Senior GM executives

Figure 7 IBM's Revenue 1992-2001



Source: Annual Report, IBM

were presented with two routes: The safe option, a redesign of the fleet following European modalities. And the risky route, a radical redesign of its fleet that evoked memories of the classic distinctiveness that was representative of the ostentatious Cadillac style. To save the icon, Cadillac took the high-risk route and developed “art and science”, the blueprint which introduced innovative design complemented by smart, targeted marketing. Cadillac introduced the 2003 CTS, the first Cadillac model to embody “art and science”, sharp and distinct lines which established it in a class of its own in the luxury sedan category. The success of “art and science” can not be measured in sales alone, which have been slow to respond, but by the reinvigorated reputation and brand image: The average Cadillac buyer's age has dropped from 64 in 2000 to 57 in 2005. The 2008 CTS recently won Motor Trend's 2008 Car of the Year award (Antoine, 2007). The Cadillac Escalade SUV is an icon amongst rap stars, young urbanites and professional athletes, the antithesis of Cadillac buyers until its introduction (McCarthy, 2005).

IBM

Change Implemented: Eliminated “silo mentality” within R&D. Sourced innovation wherever it can be accessed; internally and externally.

“Lou Gerstner sought to save the company by implementing a cultural change at IBM from

one that was individual-centric to a team-centric approach to product development.”

IBM transformed its R&D organization and instituted a company-wide cultural change upon recognition of their dated R&D structure and self-limiting culture.

By 1993, IBM was considered the largest computing company in the world, but was simultaneously reporting a net loss of \$8.1 billion, the third straight year in which losses were reported (Kannelos and Spooner, 2002; Knowledge at Wharton, 2007). Their “ingrown” company culture was proving to be an obstacle to innovation as research was kept highly secretive and siloed and working with external vendors was shunned (DiCarlo, 2002).

In 1993, incoming CEO Lou Gerstner sought to save the company by implementing a cultural change at IBM from one that was individual centered to one that encouraged a “team centered” approach to product development (Knowledge at Wharton, 2007). Internally, the company changed its focus from stand-alone product development initiatives to product development offerings focused on bundled products that provide business problem solutions (DiCarlo, 2002). Furthermore, compensation incentives were instituted to reward team efforts rather than focus solely on individual accomplishments; and overall compensation was directly linked to company performance as opposed to divisional achievements.

The corporate culture transformation has enabled IBM to consistently file the most number of patents every year. In 2001, IBM earned \$8

billion in profits from \$85.9 billion in sales, marking the eighth straight year of profit growth since Gerstner took office (Routson, 2002).

Conclusion

The mini-cases highlight eight programs that successfully implemented new processes to significantly transform the product development efforts of the featured companies. The programs delivered increased R&D productivity, higher product success rates, portfolio of innovative products and services, which in some cases established or redefined their respective industries, and higher sales and profit results.

Two common themes emerged from the mini-cases:

- Existing leadership or new leadership identified the urgency to implement change in all eight companies
- All transformation programs centered around the R&D organization

The eight mini-cases surfaced ten key changes that defined the success of programs implemented:

- Appoint, empower, and make accountable, a manager to oversee each product development program
- Strengthen product/service focus on customer/customer experience
- Streamline product portfolio; discard underperforming products and focus on innovative products with a high probability of success
- Eliminate "silo mentality" within R&D. Consolidate all R&D functions into one product development group accountable to one manager
- Nurture and leverage corporate synergies while preserving corporate values
- Communicate "change plan", assign a name/catch phrase that embodies its objective
- Source innovation wherever it can be accessed; internally and externally
- Apply discipline, focus, and accountability to the innovation process
- Embrace risk and tolerance for failure as key requirements for innovation process to succeed

References

- 3M (2002), A century of innovation: The 3M story, available from <http://multimedia.mmm.com/mws/mediawebserver.dyn?666666oZjcf6lVs6EVs666IMhCORrrrQ->; accessed 17 December 2007.
- Anthony, S.D. (2005), Motorola's bet on the RAZR's edge, Harvard Business School Working Knowledge, available from <http://hbswk.hbs.edu/archive/4992.html>; accessed 12 November 2007.
- Antoine, A.S. (2007), 2008 Motor Trend Car of the Year Winner: Cadillac CTS, available from http://www.motortrend.com/oftheyear/car/112_08_01_2008_cadillac_cts; accessed 7 January 2008
- Apple Inc. (2007), Apple reports fourth quarter results, Apple press release 22 October 2007, available from <http://www.apple.com/pr/library/2007/10/22results.html>; accessed 8 January 2008.
- Arndt, M., Brady, D. (2004), 3M's rising star, Business Week, 12 April 2004, p. 37 – 45.
- Blum, J. (2008), FDA approves 19 new U.S. drugs, fewest since '83, available from <http://www.bloomberg.com/apps/news?pid=20601202&sid=a2MOCNVDHucs&refer=healthcare>; accessed 8 January 2008.
- Business Week (2004), Innovation is job one, Business Week, 12 April 2004, Editorial.
- Business Week (2007), Skinner's winning McDonald's recipe, Business Week online extra, 5 February 2007, available from http://www.businessweek.com/magazine/content/07_06/b4020007.htm; accessed 13 November 2007.
- Colvin, G. (2006), Q&A: On the hot seat, Fortune, 11 December 2006, p. 75 – 85.
- DiCarlo, L. (2002), How Lou Gerstner got IBM to dance, Forbes.com, 11 November 2002, available from http://www.forbes.com/2002/11/11/cx_ld_1112gerstner.html; accessed 13 November 2007.
- Funding Universe, 3M Company, available from <https://www.fundinguniverse.com/company-histories/3M-Company-Company-History.html>; accessed 16 December 2007.
- Gibson, R., Gray, S. (2004), CEO's death forces change at McDonald's, The Wall Street Journal, 20 April 2004, available from <http://online.wsj.com/article/SB108237750652886504.html>; accessed 12 November 2007.
- Grossmann, L. (2005), How Apple does it, TIME, available from <http://www.time.com/time/magazine/article/0,9171,1118384,00.html>; accessed 8 January 2008.
- Hormby, T. (2006), Michael Spindler: The Peter Principle at Apple, Low End Mac, 6 April 2006, available from <http://lowendmac.com/orchard/06/michael-spindler-apple.html>; accessed 20 November 2007.
- Horovitz, B. (2004), McDonald's CEO Cantalupo restored luster of its arches, USA Today, 20 April 2004,

- available from http://www.usatoday.com/money/industries/food/2004-04-19-mcdonalds-cover_x.htm; accessed 12 November 2007.
- Huston, L., Sakkab, N. (2006), P&G's new innovation model, Harvard Business School Working Knowledge, available from <http://hbswk.hbs.edu/archive/5258.html>; accessed 7 November 2007.
- Kanelos, M., Spooner, J.G. (2002), IBM's outsider: A look back at Lou, *cnetnews.com*, 1 February 2002, available from <http://www.news.com/2100-1001-828095.html>; accessed 13 November 2007.
- Knowledge at Wharton, Lou Gerstner's Turnaround Tales at IBM, available from <http://knowledge.wharton.upenn.edu/article.cfm?articleid=695>; accessed 13 November 2007.
- La Franco, R. (1999), Eisner's bumpy ride, *Forbes*, 5 July 1999, p. 50.
- Lamm, M. (2002), 100 years of Cadillac history, *Popular Mechanics*, 1.
- Linzmayer, O., Chaffin, B. (2005), This week in Apple history, available from <http://www.macobserver.com/columns/thisweek/2004/20040410.shtml>; accessed 12 November 2007.
- Martinez, B., Goldstein, J. (2007), Big Pharma faces grim prognosis: Industry fails to find new drugs to replace wonders like Lipitor, *The Wall Street Journal*, 6 December 2007, p. A1 – A2.
- McCarthy, M. (2005), With air of cool, Cadillac becomes one hot product, *USA Today*, 20 March 2005, available from http://www.usatoday.com/money/advertising/adtrack/2005-03-20-cadillac_x.htm; accessed 9 January 2008.
- Procter & Gamble, Our History, available from http://www.pg.com/company/who_we_are/ourhistory_2.jhtml; accessed 15 December 2007.
- Routson, J. (2002), Gerstner describes bringing IBM back to health, Stanford Graduate School of Business, available from http://www.gsb.stanford.edu/news/headlines/vftt_gerstner.shtml; accessed 13 November 2007.
- Rukstad, M.G., Collis, D. (2005), The Walt Disney Company: The Entertainment King, HBS No. 701-35, Boston, Harvard Business School Publishing, p. 4 – 5.
- Shinn, S. (2007), The CEO of Accessibility, *BizEd*, 2, p. 18 – 24.
- Tilson, W. (2003), CEO of the year: McDonald's Cantalupo, available from <http://www.fool.com/investing/general/2003/10/17/ceo-of-the-year-mcdonalds-cantalupo.aspx>; accessed 12 November 2007.
- Walt Disney Inc. (1984), Annual report.
- Weber, M. (1998), Subverting the Disney legacy – How Michael Eisner has transformed the 'Magic Kingdom', *The Journal of Historical Review*, 5, p. 10 -13.
- Welch, D., Khermouch, G. (2002), Cadillac: Can GM save an icon?, *Business Week*, 8 April 2002, p. 60 – 67.
- Wikipedia, "iPod"; available from <http://en.wikipedia.org/wiki/Ipod>; accessed 8 January 2008
- Wolverton, T. (2006), Apple: Frugal to a fault?, available from <http://www.thestreet.com/tech/gamesandgadgets/10273658.html>; accessed 9 November 2007.
-