

# THE ENTERPRISE OF THE FUTURE

LIFE SCIENCES INDUSTRY EDITION



GLOBAL CEO STUDY

**SURVEY SAMPLE**

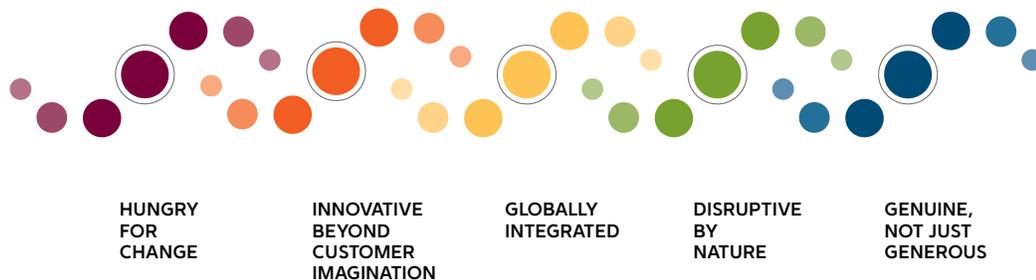
Our survey sample includes CEOs from Big Pharma companies, large biotechnology concerns, medical device and diagnostics companies, clinical services providers and medical distributors. Twenty percent of respondents are based in the Americas; 46 percent in Europe, the Middle East and Africa; and 34 percent in Asia Pacific. Almost all of these leaders were interviewed by IBM executives in face-to-face interviews lasting one hour.

## INTRODUCTION

We conducted 1,130 interviews with chief executives, general managers, business leaders and public-sector heads in the course of completing the research for our third biennial Global CEO Study, which aims to identify the key characteristics of the Enterprise of the Future.<sup>1</sup> Here we focus on the responses of the 40 CEOs who run Life Sciences companies.<sup>2</sup> The organizations they represent cover every aspect of the Life Sciences industry in virtually every part of the world (see sidebar, *Survey sample*).

Our findings show that the Enterprise of the Future has five key traits. It is:

- **Hungry for change**
- **Innovative beyond customer imagination**
- **Globally integrated**
- **Disruptive by nature**
- **Genuine, not just generous.**





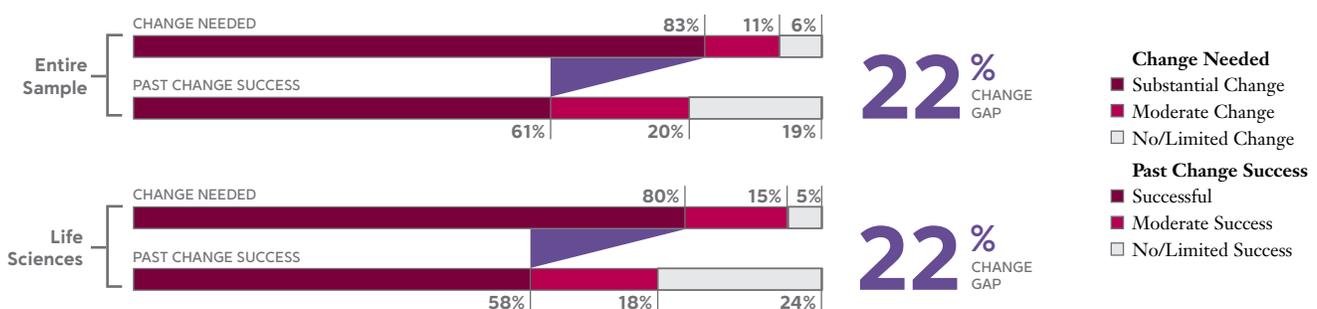
# HUNGRY FOR CHANGE

Although Life Sciences CEOs foresee much more change ahead, they're not confident about managing it. So how will they cope in increasingly turbulent times? How can they recruit the right talent, replenish their pipelines and protect their intellectual property?

Eighty percent of Life Sciences CEOs anticipate substantial changes over the next three years, but only 58 percent say that they have managed change successfully in the past. Indeed, 24 percent report that they have had limited or no success in managing change (see Figure 1).

**FIGURE 1 THE CHANGE GAP**

Many Life Sciences CEOs are struggling to keep up with the frenetic pace of change.



Moreover, the gap between those who expect change and those who have previously succeeded in managing it is increasing. "There is a lot of skepticism internally with regard to our change capabilities," the CEO of one big U.S. pharmaceutical company commented, and he was by no means alone in making such remarks.

The problem is two-fold, Life Sciences CEOs told us. The *rate* of change is accelerating, but so is the *amount*. In 2004, market factors (such as variations in customer purchasing patterns, growing competition and industry consolidation) dominated the corporate agenda. Today, however, Life Sciences CEOs must contend with many more difficulties – and people skills now top the list of issues that keep them awake at nights.

In fact, recruiting and retaining the right talent is an even greater source of concern for Life Sciences CEOs than it is for the total survey population (63 percent versus 48 percent). This is probably because biopharmaceutical R&D is a highly specialized activity – and one that will become still more complex over the next few years, with the shift to targeted treatments combining diagnostics, drugs and medical services, and the gradual convergence of the pharmaceutical and healthcare industries. The number of people capable of understanding all these sciences and working across more than one sector is likely to be even smaller than the number who can perform conventional R&D.

The research base is also shifting east; in 2006 alone, for example, 100 of the world's top R&D organizations employed more than 15,000 scientists in India.<sup>3</sup> But some Life Sciences companies are not in a strong position to exploit these new sources of knowledge. And even in countries where there are plenty of skilled individuals, this talent is not always accessible because of barriers such as language or insufficient connectivity.<sup>4</sup>

Regulatory issues – such as drug safety and intellectual property protection – likewise weigh heavily on the minds of more than half of the Life Sciences CEOs in our sample. Again, this is not surprising. All medicines are subject to stringent safety reviews before they can be launched, and the few that have accidentally slipped through the net, only to be withdrawn later on, have cost their manufacturers dearly in financial *and* reputational terms. Market factors, by contrast, feature less prominently on the radar screens of Life Sciences CEOs than those of their peers in other industries (45 percent versus 48 percent), even though intense generic competition and increasing use of pharmacoeconomic evaluations have both made the climate in which the industry operates much more hostile.

## Implications

Many Life Sciences companies are struggling to replenish their pipelines, as the patents on the blockbusters they launched in the 1990s expire and they move on to more complex scientific challenges. They understand that the economics of innovation – as R&D is done today – are unsustainable. If they are to overcome these obstacles, they will need to decide what direction they want to take, recruit people with the new skills they require, invest more effort in developing the skills of those they already employ and encourage a much greater spirit of collaboration – both within and outside their own walls.

They will also need to establish processes and structures that promote innovation, targeting in particular the early stages of research and development. Leaders must actively manage a portfolio of projects (both internally and externally) and support promising new ideas while systematically and promptly killing off the weak ones to reduce late-stage attrition.

Close collaboration with the regulators will be particularly important. The leading agencies are introducing several reforms aimed at increasing public confidence in the drug review process, so Life Sciences CEOs will need to ensure that their companies can meet these new standards and provide the safety and efficacy data the regulators require. They may also want to consider hiring people from other sectors that have already undergone major change to supplement their internal change management expertise.



# INNOVATIVE BEYOND CUSTOMER IMAGINATION

Life Sciences CEOs are investing heavily in serving newly affluent market segments. But what must they do to reap appropriate returns? How can they better understand the needs of healthcare payers, providers and patients, and develop treatments that meet these needs?

Life Sciences CEOs see the rise in the purchasing power of middle-class consumers in rapidly emerging economies and asset-rich baby boomers in developed countries as a golden opportunity to sell new products and services. Indeed, they are much more positive than the total survey population on this score. Ninety percent believe that greater global prosperity will have a positive impact on their businesses, compared with just 67 percent of the overall survey sample. This is logical; as lifestyles in the emerging world more closely resemble those in the industrialized world, the incidence of diseases like diabetes, which were formerly associated with the West, is increasing – and driving up demand for medicines.<sup>5</sup>

Life Sciences CEOs also plan to invest much more heavily in reaching these newly affluent consumers than their peers in other industries, with a mean increase of 43 percent in the amount they spend – more than double the global average – over the next three years.<sup>6</sup> The majority of them intend to focus on targeting new demographic and geographic customer segments, developing new therapies for areas of unmet need and moving into related areas like diagnostics and combination therapies, although environmental, health and safety initiatives and new operations come high on their agendas, too.

However, Life Sciences CEOs view the existence of increasingly well-informed and collaborative customers with more caution. They plan to increase the amount they invest in serving such consumers by 25 percent over the next three years (see Figure 2). Even so, the proportion of their budgets that is allocated to “information omnivores” will still be less than two-thirds of the global average.<sup>7</sup>

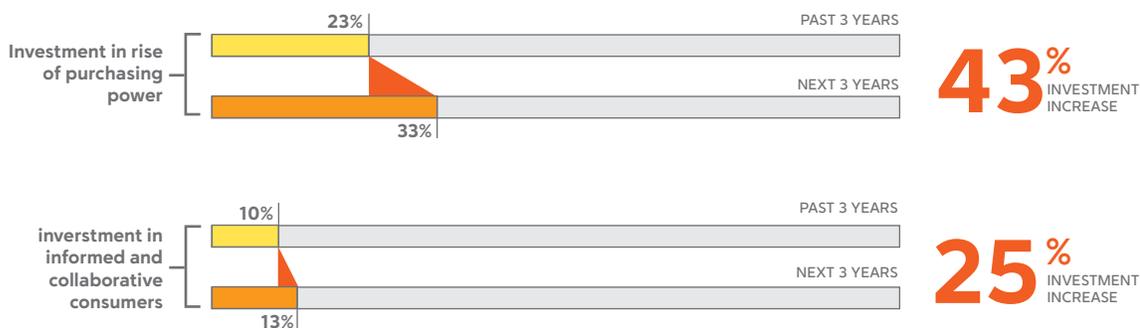
This is possibly because Life Sciences companies are prevented by law from getting too close to patients; clinical trials must be conducted via healthcare providers, for example, and direct-to-consumer advertising is banned in many countries. Nevertheless, the industry cannot afford to ignore the emergence of a more knowledgeable public. IBM’s research shows that patients are becoming

more demanding, as they bear greater financial responsibility for their healthcare and learn more about the risks associated with taking medicines.<sup>8</sup>

Some of the areas in which Life Sciences CEOs intend to invest most heavily to reach informed consumers – such as environmental, health and safety initiatives, new operations and greater transparency – may help to address these expectations. Drug safety and clear information about the potential side effects of specific medicines are both, for example, issues that matter greatly to patients. But if the industry is to develop a better understanding of its end-customers, it will have to listen and respond more carefully.

FIGURE 2 THE INVESTMENT PRIORITIES OF LIFE SCIENCES COMPANIES

Life Sciences CEOs plan to target the newly affluent but are more cautious about investing in informed and collaborative consumers.



## Implications

As patients and healthcare payers increasingly dictate the sort of products they want, Life Sciences companies will have to focus on developing genuinely innovative new medicines rather than making incremental improvements that are perceived as adding little value. They will have to engage more fully with payers, providers and patient interest groups to build a better understanding of what the markets really require and develop tools for diagnosing patients more accurately. GlaxoSmithKline has just taken a major step in this direction, with the decision to give government healthcare officials in the United Kingdom, France, Italy and Spain a say in determining which drugs it will advance through its R&D pipeline.<sup>9</sup>

Traditionally, R&D has focused on patients purely from a clinical trial perspective. Engaging them earlier, as an integral part of the innovation process – especially for chronic disease areas – can often lead to greater insights and better outcomes.

The Life Sciences industry will also have to invest in the technological infrastructure required to make sense of the massive amount of data generated by the molecular sciences. Only then will it be able to produce medicines that are truly groundbreaking – medicines that are tailored to specific disease subtypes rather than medicines that aim to treat every variant within a cluster of related diseases as if they were the same disease.

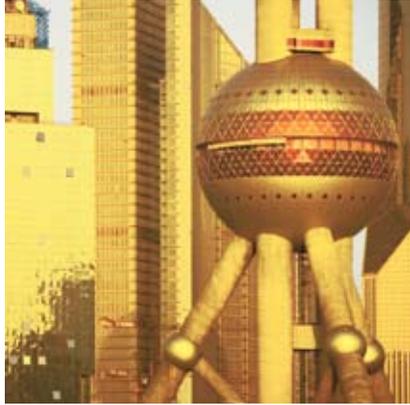
## Case study

### DR REDDY'S LABORATORIES: FIRST POLYPILL FOR HEART DISEASE

Indian pharmaceutical company Dr Reddy's Laboratories is developing the first "four-in-one" polypill for heart disease. At present, patients are required to take multiple medications, but studies show that many patients do not comply with their medical regimens – and the more complex the regimen, the more difficult it is to remember. Researchers at Dr Reddy's believe that combining four medicines in a single pill will make them easier to take, cheaper to administer and more effective in preventing strokes and heart attacks.

The company recently completed trials of the new product – which combines a beta blocker, ACE inhibitor, aspirin and cholesterol-lowering statin in a single tablet – in India, and has applied for marketing approval there. It has also secured permission to start trials in the United States, United Kingdom, Australia and New Zealand.<sup>10</sup>

Cardiovascular disease is the world's leading killer. It currently accounts for over 17 million deaths a year, but the World Health Organization predicts that the number of mortalities will rise to more than 23 million a year by 2030, as the disease burden in developing countries increasingly resembles that in developed countries.<sup>11</sup> Dr Reddy's new product could help to revolutionize the treatment of heart disease everywhere.



# GLOBALLY INTEGRATED

Life Sciences CEOs have gone further down the path to global integration than those in most other industries, but they still have some way to go. So what should they do first? Acquire new capabilities? Create multicultural organizations? Or globalize their brands?

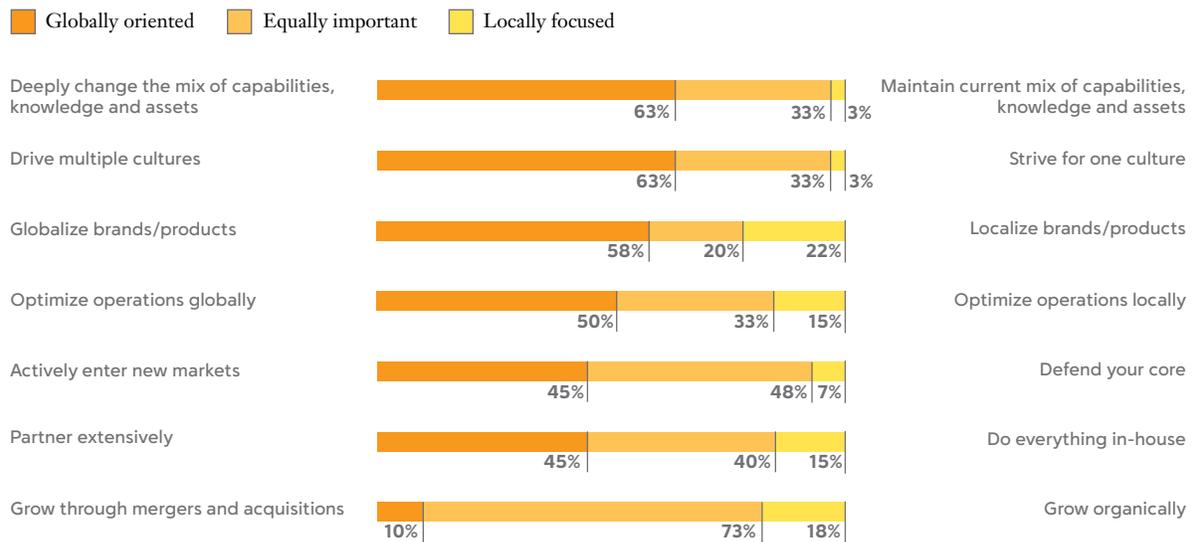
Most CEOs, regardless of the industry in which they operate, plan to make sweeping changes in their companies over the next three years, recognizing that a more connected world will require new business designs that facilitate faster and more extensive collaboration and the ability to reconfigure rapidly when new opportunities emerge. We used data clustering techniques to analyze the responses of all the CEOs who participated in our survey. Sixty-four percent are “globalizers” or “extensive globalizers”; the rest are either “blended thinkers” or “localizers.”<sup>12</sup>

However, many Life Sciences companies already operate on a global scale and have gone much further down the path to global integration than their peers in other industries. Seventy-five percent of Life Sciences CEOs are “globalizers” or “extensive globalizers,” and only 25 percent “blended thinkers” or “localizers.” In fact, the industry is more globalized than any of the other sectors covered in our survey, except electronics and automotive manufacturing.

This helps to explain some of the differences in the priorities of Life Sciences CEOs and those of the total survey population. The percentage of Life Sciences CEOs who plan to change their companies’ mix of capabilities, knowledge and assets is even higher than it is in the overall sample (63 percent versus 57 percent) – largely, we suspect, because the industry as a whole is more aware of the challenges associated with becoming globally integrated (see Figure 3). One European CEO noted, for example, that his company is “building an in-house college training program partnered with a well-known Chinese university,” a move few firms in other sectors would even contemplate.

**FIGURE 3 LIFE SCIENCES CEOS ARE PLANNING RADICAL CHANGES IN BUSINESS DESIGN**

Life Sciences CEOs are primarily focusing on developing new capabilities, creating multicultural organizations and globalizing their companies' brands and products.



Unlike their peers in other industries, Life Sciences CEOs are putting much more effort into developing multicultural organizations, globalizing their brands and products, and optimizing their operations throughout the world than they are into forming new partnerships or actively entering new markets. Our company “has one core set of values, but recognizes local cultures,” the CEO of a leading U.S. pharmaceuticals wholesaler explained, while the CEO of a large U.S. pharmaceutical concern remarked that his company needs “global brands, but local requirements are also very important.”

This is not to say that Life Sciences CEOs are ignoring the potential of new partnerships and markets. On the contrary, 45 percent of respondents propose to make major changes in both areas. "Partnerships are a key factor to help accelerate our growth," the CEO of a French biopharmaceutical company told us, while the CEO of a large U.S. pharmaceutical company commented: "Our organization has actively shifted resources from 'old Europe' to emerging markets and will do more." The situation is, rather, that many Life Sciences CEOs have moved beyond the preliminary stages of building a global infrastructure and are now busy making that infrastructure work as well as possible.

However, Life Sciences CEOs face a number of barriers to complete global integration, regulation and intellectual property protection being two of the biggest. Seventy percent of respondents worry about regulation and 53 percent about intellectual property protection. This is understandable, given that Life Sciences companies are so heavily regulated and that intellectual assets form such a large part of their market value. "Protecting the intellectual capital related to drug development is a primary and critical issue, as imitating a drug is relatively easy," the CEO of a Japanese pharmaceutical company observed.

What seems rather more remarkable is that, while the extensive globalizers are very concerned about protecting their intellectual property, the globalizers are much less worried. One possible explanation for this apparent anomaly is that the globalizers have concentrated on markets where the laws protecting intellectual rights are robust (such as Japan), whereas the extensive globalizers have spread to countries in which intellectual piracy is a more serious threat (such as China and Russia).

Insufficient talent also surfaces yet again as a major source of concern. Fifty-eight percent of Life Sciences CEOs express anxiety about finding people with the managerial or scientific skills they need. "Talent is the most critical issue," said the CEO of a Japanese pharmaceuticals company. "We need to attract the right talent. That's our weakness," the CEO of a U.S. medical device manufacturer concurred.

## Implications

If Life Sciences companies are to obtain the full benefits of global integration, they will need to ensure that they have the right mix of skills and effective employee development programs. Using relationship management tools and processes will help them attract and retain employees, while combining face-to-face learning with distributed learning will help them develop that talent. Some companies may also want to consider tapping into alternative labor pools (such as people with related skills who can be relatively easily “trained up”).

The industry as a whole will likewise need to ensure that its intellectual property is protected. The majority of pharmaceutical companies now have R&D facilities outside the countries in which their headquarters are based. Yet India, China and Russia – three of the leading new markets for contract research – are all on the Office of the United States Trade Representative’s Priority Watch List. So legislative reforms are essential to allow companies to tap the talent they need, wherever they need it, without having to worry that others will steal their work.

## Case study

### BIG PHARMA VENTURING INTO EMERGING MARKETS

Pharmaceutical companies have traditionally been wary of selling their products in developing countries where local generics manufacturers have ridden roughshod over their patents. But Big Pharma appears to be changing its stance and focusing on the developing world to a much greater extent. In April 2008, GlaxoSmithKline announced a global reorganization designed to capitalize on the growth opportunities in developing markets. It has created an “emerging markets” unit to build business in China, Russia, Brazil, India and the Middle East. This unit allows the company to be more responsive to the specific healthcare needs in those countries.<sup>13</sup>

Meanwhile, Novartis has established a research center in Singapore focusing on the development of treatments for tropical diseases and recently opened another center in Shanghai, where a number of other Big Pharma companies have also set up R&D sites. And, Merck launched Januvia, its blockbuster drug for diabetes, in India, for a fraction of the price at which it sells in the United States.<sup>14</sup>



## DISRUPTIVE BY NATURE

Life Sciences CEOs plan to reconfigure their business models extensively – primarily by specializing, becoming more efficient and building closer links with partners. But will these changes be enough to offset the decline of the blockbuster development model?

Seventy-seven percent of the Life Sciences CEOs participating in our survey plan to embark on major business model innovations over the next three years – 12 percent more than the global average. The Life Sciences industry is undergoing fundamental changes, and these CEOs recognize that they will need new business models both to cope with the transition and to capitalize on the opportunities that emerge.

More than half of them intend to alter their enterprise models, primarily by making internal improvements, differentiating their companies more effectively and building closer links with external partners (see Figure 4). Collaboration is “absolutely necessary to face all the challenges we meet,” the CEO of a French biopharmaceutical company noted.

However, a study jointly conducted by IBM Institute for Business Value and Silico Research shows that over 50 percent of all biopharmaceutical alliances do not work. It also shows that, whereas at one time Big Pharma could virtually dictate its own terms, biotech companies can now be much more selective and drive a much harder bargain.<sup>15</sup>

FIGURE 4 ENTERPRISE MODEL INNOVATION IS MOST COMMON CHOICE

The majority of Life Sciences CEOs are reconfiguring their business models to specialize, become more efficient and collaborate more actively.

**TYPES OF BUSINESS MODEL INNOVATION CONSIDERED**

**Enterprise model**

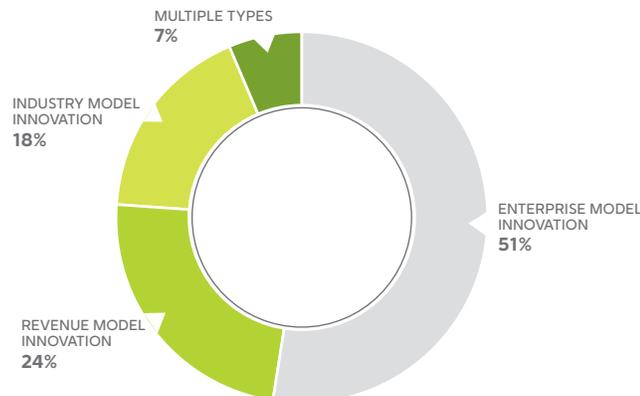
Specializing and reconfiguring the business to deliver greater value by rethinking what is done in-house and through collaboration.

**Revenue model**

Changing how revenue is generated through new value propositions and new pricing models.

**Industry model**

Redefining an existing industry, moving into a new industry, or creating an entirely new one.



This suggests that many Life Sciences companies will have to become much more adept at creating and managing partnerships. They will need to ensure that they have aligned their business strategies and organizational structure with their scientific goals, learn how to manage internal and external boundaries more effectively and remain committed to the alliances they form.

Another 24 percent of Life Sciences CEOs plan to change their revenue models by reconfiguring the mix of products and services they offer or adopting new pricing structures. Most large pharmaceutical companies have already explored various options, including capitated pricing, volume discounts and rebates, but a growing number are now experimenting with pay-for-performance – where the price of a medicine is based on how well it works, and can be adjusted up or down as new evidence emerges.

Yet only 18 percent of Life Sciences CEOs intend to change their industry models. It is clearly far more difficult to redefine an existing industry, move into a new industry or create an entirely new industry than it is to make internal improvements or form alliances with other organizations. Even so, this is marginally less than the global average – and particularly surprising in view of the fact that most industry experts believe the traditional blockbuster model of drug development is moribund. Indeed, JP Garnier, former chief executive of GlaxoSmithKline, recently admitted as much, when he argued that the development of new medicines will change, with the creation of “progressive blockbusters” based on segmenting potential patient populations and adding more “slices” over time.<sup>16</sup>

## Implications

Collaborative innovation is critical to drive not only *more* innovation, but also *faster* payback. Through creative partnerships and alliances, Life Sciences tie-ups can develop molecules faster and more rapidly replace the revenue from expiring patents.

Increased collaboration will be particularly important as the emphasis shifts from blockbusters to targeted treatments. Medical devices, diagnostics and support services will play as important a role as medicines in the development of healthcare packages for patients with different disease pathologies. So the separate elements of the Life Sciences industry will increasingly converge. Pharmaceutical companies, device and diagnostics manufacturers, and healthcare providers will all have to work much more closely together – and interoperability will be essential to ensure that they can share data effectively.

## Case study

### PIONEERING NEW BUSINESS MODELS IN PHARMA

Moksha8, a new pharmaceuticals firm launched in April 2008, aims to capitalize on the growing demand for branded medicines among affluent consumers in emerging economies. Its enterprise model is highly specialized and based on partnerships and alliances. It has already licensed more than 20 drugs from Roche and Pfizer to market in Brazil, and investors expect annual sales to top US\$1 billion within a year or two.<sup>17</sup>

Meanwhile, Johnson & Johnson has been altering its revenue model. In June 2007, it offered the U.K. National Health Service a groundbreaking “money-back guarantee” for use of its oncology drug Velcade. If a patient shows no improvement after four cycles of treatment, Johnson & Johnson will refund the costs.<sup>18</sup>

Instances of industry model innovation are much more infrequent and tend to be undertaken by smaller companies in the industry. One example to watch is Quintiles. Through its investment arm NovaQuest, the company is rapidly overturning the traditional concept of a contract research organization (CRO). Instead of focusing solely on clinical trials, the CRO is broadening its focus, moving up the supply chain and participating in the early phases of R&D. NovaQuest is engaged in drug discovery partnerships with more than 35 companies.<sup>19</sup> For example, it has set up a services partnership with Solvay Pharmaceuticals, helping to fund Solvay’s Phase II portfolio in return for milestone payments.<sup>20</sup>



# GENUINE, NOT JUST GENEROUS

Socially minded customers, workers, partners and investors are now watching almost every move companies make. Life Sciences CEOs have responded with patient assistance programs and more research into neglected diseases. But are they ready to manage other aspects of corporate social responsibility?

As customers, employees, investors and other stakeholders become more socially aware, CEOs everywhere are increasingly concerned about corporate social responsibility (CSR) – by which we mean acting in an ethical fashion that considers the needs of the workforce, society and the environment, as well as those of investors. CEOs in the Life Sciences industry are no exception; 62 percent regard the growing importance of CSR as a positive trend. Collectively, respondents also propose to raise the amount they invest in CSR by 33 percent over the next three years (see Figure 5).

**FIGURE 5 LIFE SCIENCES CEOS ARE GENERALLY POSITIVE ABOUT CSR**

They plan to invest more than the global average in CSR over the next three years.



This is significantly more than the global average. It is also more than CEOs in the Life Sciences Industry plan to invest in reaching informed and collaborative customers. However, they place much more weight on socioeconomic factors than they do on environmental issues. Many Big Pharma firms now run drug donation and patient assistance programs, for example, and a growing number of companies are researching new medicines for diseases that have devastated the poorest parts of the world, like malaria, tuberculosis and leprosy.

Conversely, few Life Sciences CEOs see environmental factors as a major concern, although the CEO of one U.S. healthcare services company acknowledged the “new pressure” from “the federal government and consumers” to become more transparent about such matters. This is possibly because the industry leaders are already sensitive to the environmental impact of their activities, as a result of their historical roots in chemicals- and dye-manufacturing. Nevertheless, it suggests that some companies may need to change their perspective and become much more proactive.

## Implications

Life Sciences CEOs obviously take their social duties very seriously, but they must be prepared to understand and manage a much wider range of CSR expectations in the future. There is, for example, a growing body of opinion that pharmaceutical manufacturers should be held accountable for the indirect environmental effects caused by residual traces of hormones and other medicines which are not removed through typical wastewater treatments.<sup>21</sup> As the industry moves to biologics and more sophisticated devices for delivering new medicines, its ecological footprint could expand even further.

## Case study

### NOVO NORDISK: HELPING PATIENTS AROUND THE GLOBE

Danish pharmaceutical company Novo Nordisk has impeccable CSR credentials – and a clutch of awards to prove it. In 2007, the Dow Jones Sustainability Indices named the firm Healthcare Sector Leader of the year, citing its strong performance in human capital development, philanthropy, social reporting, animal testing and bioethics, as well as its commitment to the prevention of climate change.<sup>22</sup> In mid-2008, the company also earned second place on a new index that ranks drug makers based on eight social criteria.<sup>23</sup>

How has Novo Nordisk done it? Support for CSR starts at the top; the chairman is a passionate advocate of CSR and “stakeholder relations” is included in the executive management team’s remit. Novo Nordisk also treats CSR as an integral part of its business strategy and has introduced three control mechanisms – facilitators, a balanced scorecard and sustainability reporting – to encourage its employees to act in a way that meets its corporate goals.

The facilitators – a team of high-profile professionals at the holding company – visit each business unit every three years. They perform on-site audits, provide advice and identify “best practices” that can be shared across the organization. Novo Nordisk also measures the performance of each business unit and sets individual targets, using a balanced scorecard that includes key social, ethical and environmental performance indicators. Lastly, it publishes extensive information on its social and environmental performance in its annual reports, using six specific criteria (such as its use of animals, eco-efficiency and success in improving access to health).<sup>24</sup>

## BUILDING YOUR ENTERPRISE OF THE FUTURE

Life Sciences CEOs fundamentally agree with the CEOs in our overall survey sample about the features that will characterize business in the future. Their responses suggest that the successful Enterprise of the Future – as we have called it – will be hungry for change; innovative beyond customer imagination; globally integrated; disruptive by nature; and genuine, not just generous.

However, the challenges they face differ from those of other CEOs in various respects. They are more worried about managing change, recruiting and retaining people with the skills they need, and dealing with the growing regulatory burden. They are also more concerned with building truly multicultural organizations, globalizing their brands and products, and optimizing their operations worldwide. And they are more likely to be planning major business model innovations.

The critical question is: how can they ready their companies for these challenges? How can they hire visionary scientists and managers capable of questioning the status quo and pioneering new ways of doing things? Create an adaptable workforce and infrastructure to ensure that viable new ideas can be quickly exploited? Find the

partners they will need to develop healthcare packages for patients with specific disease subtypes and serve new markets? Make their global operations as efficient as possible? Prepare for new responsibilities, such as increasing regulation on drug safety or additional environmental obligations?

**FIGURE 6 THE FIVE KEY TRAITS OF THE ENTERPRISE OF THE FUTURE**  
Where does your company fit in each of these five categories?



We look forward to learning more about where you think your business and the Life Sciences industry as a whole is heading – and working with you, as you build your Enterprise of the Future.

For additional information about the Global CEO Study, visit:

**ibm.com/enterpriseofthefuture**

To discuss the Life Sciences industry implications further or to evaluate your company's progress using our Enterprise of the Future assessment tool, we invite you to e-mail one of the following contacts:

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## ABOUT IBM GLOBAL BUSINESS SERVICES

With business experts in more than 170 countries, IBM Global Business Services provides clients with deep business process and industry expertise across 17 industries, using innovation to identify, create and deliver value faster. It offers one of the largest Strategy & Change practices in the world, with over 3,250 strategy professionals. The IBM Institute for Business Value, part of IBM Global Business Services, develops fact-based strategic insights for senior business executives around critical industry-specific and cross-industry issues.

The IBM Life Sciences team has extensive industry knowledge and innovative solutions to assist clients with specific strategic and operational challenges facing the industry. Additionally, IBM Research continues to invest in new ways to apply technology and advanced methodologies to further our clients' progress with genomics, computational and systems biology, and medical informatics.

## NOTES AND SOURCES

- <sup>1</sup> "The Enterprise of the Future: The Global CEO Study 2008." IBM Institute for Business Value. May 2008.
- <sup>2</sup> For readability, we have referred to all respondents as "CEOs" throughout the remainder of our report.
- <sup>3</sup> "Research and Development – Overview from IBEF." India Brand Equity Foundation. July 2007.
- <sup>4</sup> "Pharma's new worldview: Transforming R&D through emerging markets." IBM Institute for Business Value. September 2006.
- <sup>5</sup> Ibid.
- <sup>6</sup> In our survey, the term "total investments" was defined as: all asset investments plus investment in research and development, marketing and sales.
- <sup>7</sup> "Information omnivores" crave all kinds of information and often broadcast their views and expectations worldwide via the Internet. They are increasingly becoming "producers" as well as "consumers," creating entertainment and advertising content for their peers, while demanding flexibility and responsiveness from the companies with which they choose to do business.
- <sup>8</sup> "Healthcare 2015: Win-win or lose-lose?" IBM Institute for Business Value. October 2006.
- <sup>9</sup> Whalen, Jeanne. "Glaxo Seeks Guidance From Health Systems." *The Wall Street Journal*. July 7, 2008.
- <sup>10</sup> Mukherjee, Rupali. "Single pill for all lifestyle ailments." *The Times of India*. May 30, 2008.
- <sup>11</sup> "World Health Statistics 2008." World Health Organization. May 19, 2008.

- <sup>12</sup> "Extensive globalizers" are highly networked businesses with a global approach to every element of integration. "Globalizers" are businesses that aim to operate globally and have already acquired some of the capabilities, knowledge and assets they need. They also have a single culture rather than multiple cultures. "Blended thinkers" are businesses that are trying to optimize through a mix of global and local approaches, with multiple cultures. And "localizers" are insulated businesses with a blended growth approach.
- <sup>13</sup> "GSK announces changes to Corporate Executive Team." GlaxoSmithKline Press Release. April 30, 2008. [http://www.gsk.com/media/pressreleases/2008/2008\\_pressrelease\\_10037.htm](http://www.gsk.com/media/pressreleases/2008/2008_pressrelease_10037.htm)
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