INFORMATION TECHNOLOGY

BY TAREN GROM

The pace of developing IT solutions within the pharmaceutical industry is increasing dramatically, as companies adopt IT as a catalyst for change

> Pharmaceutical companies have long-term plans, they have products that take a long time to develop, a long time to test to gain approval, and they have a shelf life. But technology moves so much faster than that. So the industry as a whole has had to adopt to the speed of technology.
>
> **IAN CROSS**

$1.2 trillion is the estimated value of the healthcare market, which is about 16% of the U.S. gross national product, and an estimated $100 billion a year is wasted through information inefficiencies.

Pharmaceutical company CEOs are starting to pay more attention to business-continuity planning, IT departments are looking for ways to provide higher levels of data availability, and vendors are developing creative new ways to address information challenges. These initiatives are being driven by e-technologies, particularly the Internet.

Companies are no longer investing millions of dollars in monolithic systems that take years to pay for.

Increasingly, companies are developing pilot information technology programs to test the waters. Companies are recognizing the need to quickly evaluate a program, and to pull the plug on failed initiatives. They are just as quick to broaden the pilot if an initiative shows promise.

Pharmaceutical companies, according to industry experts, are still probably two years away from really being mainstream in knowledge management. Many companies are still reticent to make sweeping changes. A few companies are diving in deep, with dictates for improving information-technology functions coming from top management.

Companies are beginning to understand that technology by itself can be a very effective change agent. Some are taking advantage of the opportunity to re-engineer their processes, by using technology to accommodate new common elements in a given business center.

In the past, the companies' emphasis was toward physicians, but now there is a shift to put the patient at the center. Companies that are building systems and business processes around the needs of the patient are completely changing their approach to implementing IT solutions.

Information technology is undergoing a huge transformation within the pharmaceutical industry. The pace of developing IT solutions is increasing dramatically. Company managers must continue to fund and explore new technology solutions. Through the development of smart, well-thought out solutions, companies can increase the speed and efficiency of clinical trials, global product management, outsourcing, procurement — all of the processes along the development and marketing continuum.

Only through making smart IT decisions will companies be able to compete more efficiently. Only through smart partnerships with vendors will companies be able to implement the solutions necessary to achieve IT competencies. Companies that do not adapt to the IT evolution, will be left behind, facing a fate of being acquired or having to merge. While the best strategy may not be to change IT every year and a half, pharmaceutical executives are being kept continuously appraised of state-of-the-art software and hardware solutions to avoid the risk falling competitively behind.

HOT LINKS

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LYDELL CAPRITTA. President and CEO, Blue Diesel, Columbus, Ohio; Blue Diesel, an interactive and Web-development agency, is an operating company of inChord Communications Inc.

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STEPHEN COADY. CEO of Apelon, Ridgefield, Conn.; Apelon is a supplier of healthcare terminology software and services

IAN CROSS. CEO and co-founder, I-SITE Inc., Philadelphia; I-SITE is an Internet development and consulting group

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BRUCE FADEM. VP corporate information services and chief information officer, American Home Products Corp.,Whitehouse Station, N.J.; American Home Prod-

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ROBERT JAMES. Global IS director, P&G Pharmaceuticals, Cincinnati, Ohio; Procter & Gamble Pharmaceuticals is a research-based global organization and a part of Procter & Gamble Health Care, a division of The Procter & Gamble Co., which is a global leader in the development, manufacturing, and marketing of a broad range of consumer goods

GEORGE LASZLO. Partner and director of Life Sciences Solutions, Healthcare Group, Computer Sciences Corp., Berwyn, Pa.; CSC's Healthcare Group is an industry leader in the strategic use of information technology to achieve business results for payers, providers, and life-sciences organizations

JOHN S. MCILWAIN. Chairman, co-founder, chief executive, Velos Inc., San Francisco, Calif.; Velos is a designer and developer of healthcare information systems, providing an integrated clinical and administrative product suite for specialty medicine and clinical research

DR. ASH NASHED. President, CEO, founder, MDChoice.com and Healthscout.com Somerville, N.J.;MDchoice.com and Health-

scout.com are leading providers of innovative products and services for health-related Websites, healthcare providers, consumers, and the pharmaceutical industry

GREG BARNES NELSON. Statprobe Technologies, Cary, N.C.; Statprobe Technologies is a high-performance software development and design firm that works closely with clients to achieve effective and appropriate technology solutions

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ANDREW WEISSBERG. VP of business development and chief technology officer, CPRi Communications, Teterboro, N.J.;CPRi is a healthcare and high-tech marketing communications firm

STEPHEN WIEHE. President and CEO, SciQuest Inc., Morrisville, N.C.;SciQuest is a technology and solutions company that provides integrated e-commerce and research asset management solutions for research enterprises and their supply-chain partners worldwide

Tying technology to the business strategy

DUNBAR. There are key factors that are contributing to Lilly's IT progression. The first one, which is probably the most important, is having a defined information strategy for Lilly, which is absolutely congruent to, and deeply tied to, the business strategy. There has been a very deep level of integration through all sectors of the company. A lot of IT in the pharmaceutical industry is done within silos, such as discovery, R&D, or sales and marketing. At Lilly, we view IT at an enterprise level along with the enterprise strategy. We determine that there are opportunities for strategic points of focus for IT based on how we view optimizing the entire enterprise. We don't look at IT on a tactical level alone and figure out that a particular application or process in one area would be neat. We look at the whole enterprise to determine at what point do we have an opportunity to differentially invest in IT to facilitate processes that are very valuable in one area, but also optimize the entire value chain.

JAMES. I have responsibility for most aspects of IT as it relates to our pharmaceutical business, which is just under a $1 billion category of P&G and rapidly expanding. The primary focus areas for IT today at P&G Pharmaceuticals are in R&D and sales and marketing. Our IT strategy has been driven by the growth of pharmaceuticals at P&G where we've implemented global enabling systems ahead of the development and launch of new global brands from our R&D pipeline. We first established integrated global regulatory and clinical development systems just over six years ago and are currently implementing our second generation. Similarly in the late 90s, for manufacturing and logistics, we put in place an integrated SAP R/3 solution for all our plants worldwide. In Europe and North America we've recently invested in a new common CRM platform with hand-held technology for our salesforce. In many ways, we've been fortunate at P&G Pharmaceuticals to have the flexibility while we're relatively small to move quickly and establish integrated solutions. For the most part this isn't so easy for bigger pharma companies with more complex and decentralized IT architectures, although of late we're seeing more signs and recognition within the industry to the benefits of global scale.

FADEM. People get excited about sizzle — systems that are interesting and appear to be very exciting, but at the end of the day don't fundamentally change the business of the company. At American Home Products we are doing quite a bit of sizzle that is changing the business. We are doing an enormous amount with e-technology capabilities on a global

basis. We are leveraging e-technology to deal with such things as global pricing and global inventories across all of our affiliate operations. Using e-technology allows us to provide true transparency to that information for our entire organization. On a more mundane basis, we are very committed to innovation that changes the way in which the company will operate, not only today, but in the future. We are focused on developing a true global data warehouse. We have a massive program under way that takes the critical data from all of our operations on a global basis and makes the data available for a wide range of production systems and general ad hoc managerial reporting. We are going gang busters on providing remote access services to both our mobile employees as well as those employees who are in remote locations. The service is being built on something that we think is innovative, but not something people talk about a lot — a true standard technology platform and shared services for IT on a global basis.

RUNGE. I lead the Aventis U.S. e-business team and coordinate the North American activities. We are a business group, but we like to bill ourselves as the link between the business and newer technologies. We were specially created to bring all of the latest technologies in from our horizon scanning efforts and integrate them into the company. This is an expertise that neither Aventis Pharmaceuticals nor the parent company had. Our charge is to integrate technology rapidly within a very conservative industry and a very conservative company. The group is a little more than 1 year old. We started from one and we are now at 33. We are built for rapid implementation to get things from a sales and marketing perspective quickly into the business. We have a broad array of activities because we are committed to leading the industry through e-technology and reshaping relationships with physicians and customers, patients, and payers.

FADEM. At the top of our list is improving the productivity quality of our organization. And that applies to all facets of the business — salesforce, supply chain, quality assurance, commercial operations. In each of those areas we are focusing as a company on improving quality and improving productivity.

DUNBAR. Our business priorities evolve in part because our business continues to evolve and new points of emphasis arise. And as we become competent in delivering on last year's key priorities we are able to move on.

FADEM. The pharmaceutical industry is learning what several other industries have learned — that no one is good enough to be able to forecast business needs and business conditions five years in advance. What we can do is estab-

lish a vision and then move toward that vision. On a continuous basis we have to reassess business needs, economic conditions, and changes in technology. We continually look at our business strategies and the technology solutions.

A commitment to IT from top management

RUNGE. Our IT initiatives are endorsed from the very top. Our global CEO, Dick Markham, stated that we will lead in the e-business area. This was echoed by our global chief operating officer. These gentlemen have gone on record stating the importance of our work and that we will lead the industry through changing relationships by bringing in new e-technologies.

FADEM. The level of commitment and investment that AHP is making in IT today versus five years ago is amazingly different. Starting at the very top of the corporation the decision was made to take advantage of IT and recognize that it is critical to our future success. I don't think anyone in our company has any doubt that we have dramatically ramped up, not only the commitment, but the investment.

JAMES. Many of us are in search of the Holy Grail. There's been a shift in the past five to six years; often information technology was only viewed as a service provider. In today's marketplace, CEOs and senior executives take a different view and expect much more. The company-wide expectation is to really leverage IT to gain a competitive edge, if they don't, the company won't be successful. The challenge is "where to play" and how to leverage technology as a core competency where it fits with company goals. In this we have to be choiceful and not always follow the latest technology trend.

Off-the-shelf-solutions replace custom applications

JAMES. Technology churn is increasing but with a lot less massive investment in huge mission critical systems than we have seen in the past. In today's climate, pilot projects are key to determine ROI, with more of an attitude of, if we're going to fail, let's fail fast and cheap. If we succeed, let's get scalability in a proven production solution as quickly as possible.

LASZLO. No one is building monolithic systems anymore. One of the lessons learned from the implementation of ERP systems, especially with SAP, is that throwing a lot of money at multi-year projects just doesn't work. It's not because the technology doesn't work, but the business sponsors simply tried to do too much

in a single shot. There are any number of examples where companies have simply shut down a project after an investment of $30 million to $60 million, recognizing that it was just a bad idea. Today, pharmaceutical companies are looking for quick incremental wins, in two- to three-month intervals. They want to see tangible benefits to users before moving to the next step.

WIEHE. Five or 10 years ago, pharma tended to be very independent. For example, Glaxo, Pfizer, or Merck would have said their processes were very different and unique. As a result, because they believed they were so different, the technology had to be custom. What companies have discovered through mergers, is that their processes aren't so different. There's been a realization that it's better to use external vended, more packaged-based solutions than building a custom system. Companies found that they spent a lot of money building big complex solutions and at the end it would have been cheaper to buy something.

LASZLO. In the past, pharmaceutical companies could afford to develop custom solutions because times were good for the most part. One of the ways they've become smarter is neither to customize nor to build systems from scratch but to buy applications off the shelf and put the emphasis on configuration rather than customization. The technologies that are available today are much more sophisticated out of the box and have capabilities that couldn't have been imagined even two to three years ago.
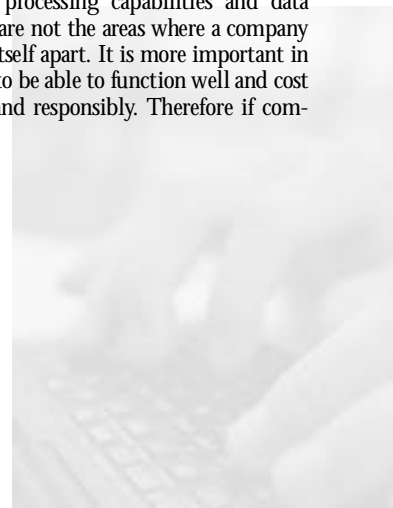
GRATZ. Clients are buying custom applications that are re-usable. Back-office applications for content management and data warehousing now tend to be off-the-shelf set ups.

DUNBAR. Our preferred approach is always to buy because we can implement the solution faster. So we try to buy and then integrate packaged solutions. In some cases that's possible, in other cases it is not. When it isn't possible we build our own.

JAMES. Clearly much of our pharmaceutical strategy is about leveraging P&G's global scale and core competencies. In this IT is no different. Wherever possible we reapply P&G's technologies and systems in our pharmaceuticals category. If there's not a viable P&G solution available, we look externally for a global pharma package, which we can configure for key local market requirements. If we can't get any of those, only then will we develop something unique.

FADEM. Both the global data warehouse and the remote access services are technologies that are commercially available and we are implementing them in a fashion that is compatible with our technology environment and our business needs. What the pharma industry has come to realize, as many other industries did years ago, is that there are differentiators on which the company can focus. Fundamental transaction processing capabilities and data acquisition are not the areas where a company should set itself apart. It is more important in those areas to be able to function well and cost effectively and responsibly. Therefore if com-

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>
> **PETE SANDFORD**

> One interesting area will be voice technology. There are voice portals, in which somebody can call a number and literally talk to a computer interface.

ASH NASHED

> A growth area that is really important, which has not been fully tapped, is the electronic medical records market. About 8% of the physician market uses an EMR, that is definitely going to grow, for various reasons, one being HIPAA.

ANDREW WEISSBERG

> The question of ROI has finally come back to the interactive group, we are back where we should have been all along — being smart about how we spend money. We can't just spend money on interactive because it's fun or cool, which is how the interactive business grew up.

LYDELL CAPRITTA

mercially available solutions can be found, that's a much smarter way to go.

Technology in a highly regulated environment

LASZLO. Some areas of the pharmaceutical organization are more innovative than others. For example, genomics and bioinformatics are at the cutting edge of IT compared, for example, with manufacturing operations. That perceived necessity is the mother of invention and innovation. Some companies, Pfizer for example, will try anything and everything having to do with technology, because it's part of their culture. On the flip side, are companies that are more cautious and conservative. They will wait until another company tries and proves the technology before jumping on board.

NELSON. The industry tends to be slow to adopt technology because of uncertain regulatory environments, companies want to minimize the pain of being scrutinized. A few key adopters pave the way for everybody else, then there's a delay. Pharmaceutical companies are probably two years away from really being mainstream in knowledge management.

RUNGE. Our communications with physicians and with patients are highly regulated. Sometimes this is at a cross purposes with a technology that is designed to increase the speed of connectivity and broaden the connection points. The pharmaceutical industry has clearly known for a number of years that it has to adopt new technologies because it's being forced by the popularity of the Internet and it's being forced by consumer interest in better access to healthcare.

JAMES. The pharmaceutical industry is complex with historically a zero tolerance for failure, certainly as it relates to technology. We have very stringent FDA regulations, which are increasingly becoming more complex as they relate to systems, data, and electronic records. In addition, the market itself is highly fragmented, both in terms of pharmaceutical companies, suppliers, influencers, partners, regulators, and customers. There is not one integrated model today and despite the huge potential, many of the vested parties have been reluctant or slow to adapt to standard or integrated healthcare information solutions. Last but not least, we have a physician population that is in overload right now. While I believe they are interested in enabling technology in

particular that helps their daily workflow, today it is not their highest priority.

FADEM. It's all about the business need. The pharma industry, because of what it does and how it does it, other than in the research arena, didn't have a pressing need to leverage technology aggressively. It's only been in the last five or six years where the level of competition has picked up among the pharmaceutical companies and the economic pressure on all of us to perform has made information technology such a valuable resource.

Developing data warehouses for increased efficiency

JAMES. Like many others, we are trying to drive our commercial focus further back into R&D so that we have internal alignment earlier in the pipeline and make better clinical choices. The decisions we make very early on in the pipeline are crucial, when we get it right then the company benefits as well as future patients. In this sense, our investment in R&D data warehousing and new data analysis capability is central to speeding our pipeline.

FADEM. The concept of a global data warehouse is ancient; it is its application to the pharmaceutical industry and execution that is unique. Most pharmaceutical companies are an amalgamation of separate businesses or separate organizations and even the most sophisticated have a wide range of systems, legacy as well as current technology. There are critical data in all those systems. The effort to manage the organization on a global basis requires a company to get data out of all those systems. An optimal way of dealing with this challenge is to provide an automated capability that takes all the critical data that are buried in those systems and place the information into an environment called a global data warehouse. The global warehouse has tools that allow data to be cleansed, standardized, and relayed to management and business units. Our scope is extremely broad in terms of business processes, it covers forecasting to global branding to our research portfolio to capacity planning, pricing, finance, human resources. The warehouse stores all the data that are needed by management to run the business, to make decisions, to ensure that the company is making the best use of its resources, and driving the business to increase productivity.

DUNBAR. We're trying to improve the probability of technical success in the discovery area. As molecules are discovered in the discovery part of our business, we need to ensure that the information packages around those molecules are complete and that they are going to be of value further up the chain as the product

moves into human trials, into product development, ultimately to the manufacture of the product. Systems have been built with a view of the passage of a molecule along the enterprise over time. Cycle times from discovering a molecule to it ultimately reaching the market may be 11, 12, or 15 years. We have to take a long view of the information systems that will help molecules move along. We have developed a tool we call the molecule library, which is a knowledge management tool. It captures all of the relevant information on a molecule from Day 1 all the way through to the data that would be incorporated in the submission document to the regulatory authority. This library may contain data for a molecule that are 20+ years old. In many pharmaceutical companies, different databases contain information on a molecule that was captured in one or another phase of its life. The information databases very often are isolated, they don't talk to one another, and they weren't built in the right way. There is no continuity of information. Today, we have a system where somebody can go to any desktop and with the click of a few buttons pull out any information relevant to a molecule that has been logged in. That may sound pretty ordinary, but in the past it could have taken weeks to find a piece of work on a molecule that was done five or 10 years ago. We started building the molecule library more than a year ago. The approach that differentiates Lilly to a certain extent, is we start with a 90-day horizon. The library was in use 90 days after we began building it. The library already is populated with well over 600,000 documents. Ultimately, there will be about 5 million documents in the library. Moving up the value chain, in clinical development we need to be able to work very quickly and we want the information available to create clinical dossiers that will go to the regulatory authority. We also want databases that can be accessed once the product is on the market or even before the product is on the market.

FADEM. Our global data warehouse has a relatively long history. Its origins go back about four years. And as is the case in most of these long-term major infrastructure initiatives, the information services organization recognized the need for such a system, but it also recognized that it would take some time to put an infrastructure in place that would allow true business use. That's a difficult thing to get business units to understand. In the first two years, the information services organization made the investment to put the fundamental infrastructure — the database tools and decision-support analysis tools — in place and began stripping the data from production systems. It's really only been in the last 18 months that the business units have taken the lead. They have now seen the benefit. Many of the business units are lining up to throw money

and resources at us to make sure that their particular data needs are included in the program.

NELSON. We do data warehousing decision support to help companies structure data in such a way that they can look at the information from a historical perspective. Most operational systems, whether they be supply-chain management, customer-relationship management, or risk management, focus on current activities, they don't focus on the historical perspective. Data warehousing helps take that data in aggregate across business units, across organizations, across studies.

DUNBAR. We are building future systems to manage clinical trials better than ever before. True to our approach of building iteratively and delivering components that are usable, earlier in the year we were able to complete some Phase I clinical trials with our new e-data management system. The first goal that we had was to dramatically collapse the time cycle of trials. One of the key parts of any trial is the time between having the last patient visit and being able to analyze the results of the trial. This usually takes six weeks or more, even for Phase I trials. We now have this process down to 11 hours. We've been able to replicate that across our two first trials. We believe 11 hours, once we get good at this, will look tardy.

Integrating ROI Evaluation Into the Process Sooner

WIEHE. In the past nine months or so, there's been talk regarding hidden ROI — companies are spending a lot of time looking at how to quantify the value of their IT investments. In the past, companies would spend a vast amount of money because their competitors were. Now, companies are looking to identify tangible benefits immediately. There's a trend to provide solutions that are cost-effective and that have very rapid ROIs. Clearly pharmaceutical companies are not going to evolve their IT every month or every year — product cycles are too long — but they are starting to think in shorter time frames.

BLEICHER. ROI reduces the cost of traditional data management and monitoring. One of the problems is that pharmaceutical companies don't have a real handle on how much they spend on individual programs, what the costs are for investigators to travel to a site, the number of visits CRAs need to make, and the amount of time it takes for people to enter data and review data.

BLEICHER. Time is parallel not serial. Through one of our systems a client was able to identify some adverse experiences about three months sooner, which were significant

enough to end development of a particular drug. This three months saved the company all of the money that it had spent on the system in the first place. That's ROI on one compound, in one area of clinical development.

DUNBAR. There is a definite emphasis on getting value sooner. Clever companies are doing this is by using an iterative model. It may be a big project that could go on for three years, but the company wants value from it within the first six months. We break down a project, and ask what is the most important thing that could be delivered for the business users who need it. We then try to deliver that component first. Our e-data management program is a very good example. Our people are already using the system even though we are still probably another two years from completing the all required elements.

FADEM. Evaluating ROI is fundamentally done on an individual initiative basis. AHP is famous, maybe infamous, for having a very rigorous funding proposal review process. Each of our major projects goes through a formal review that has to be substantiated by a business case. Most of the time the business case is ROI based, but there are other business criteria too, such as regulatory requirements and market conditions.

RUNGE. We run on a fast-fail basis. That's one reason for piloting instead of going out with large-scale initiatives. We have a number of small initiatives that we track so closely that when we get the sense that they are failing we dump them. We have permission to fail and we have permission to try a lot of things. But pro-

grams don't drag on for two or three years. That's where we think Aventis is different from other pharmaceutical companies. We are trying so many things. We're trying them in small ways, we're not the biggest or the boldest in any particular vertical and we're not always the first in some of the verticals. We don't expect traditional ROI from all of our pilots. For example, for e-detailing we can get

If one could encode all the different ways that people were describing something, then there's a higher probability of observing a statistical correlation.

STEPHEN COADY

a standard ROI, things like time savings and cost savings. We are having great success with e-detailing. We are getting about an eight-minute to nine-minute average for all of our calls in e-detailing opposed to the industry standard of two minutes per call with a physician. We're also getting three products compared with the industry standard of one and a half to two in the field. Nobody at Aventis is

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KELLY GRATZ

Web activities are starting to get more into the core business strategies of pharmaceutical companies.

BOB CHRISTENSEN

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> **GEORGE LASZLO**

trying to swap e-detailing for feet on the street. We're doing it as a complimentary activity. Our system links with the field-force system.

SANDFORD. Sales training is so important and we're doing that online. This approach allows pharmaceutical companies to take advantage of technology and get their people up to speed rapidly, on a range of things. By turning to online applications they are getting a national and global reach. This produces benefits, from manageability to cost savings, and allows for greater flexibility in the process.

NELSON. Ultimately, ROI comes down to not how much money is saved but how much revenue is generated. We focus on helping companies figure out how much money an application will make them. We can talk all day long about the soft dollar, but in a tight economy, it's not always how much is saved but how much is made.

FADEM. If you read the tea leaves right now there's beginning to be a push on the part of large corporations on technology vendors to slow the pace of pure technology change. Take specifically the desk-top environment. It takes a large corporation two years to make a technology change on a desk top. We'd really like to get some leverage out of it. The thing we don't want to do is immediately move into another change that has costs associated with it. The name of the game is not to make an investment and then make another investment, then make another investment. It's about making an investment and getting value from it.

SANDFORD. There is quite a bit of emphasis these days on extending the life of the content over a variety of different platforms. The dollars are there, but what's happened is that the use of those dollars has become much smarter than it was in the past. The idea that companies had of just throwing money out there and that it would be good for their customer and good for their business, isn't working anymore. It's important to us and to our customers that we show good ROI on all our projects.

Web-based Applications Are Fostering IT Growth

DUNBAR. A lot of what we've been able to do is a result of the value of the Internet as a tool. And the fact that we're able to move from systems that were built on mainframes that limited connections to a much more flexible set of Web technologies has allowed us to move forward.

CROSS. When e-healthcare began to be used as a tool for marketing products and developing products, the industry didn't really drive that process. The actual evolution of e-healthcare was driven more by the portals and healthcare companies such as Medscape and the information providers. The pharmaceutical companies became more like third parties in the way they marketed their products on the Internet. Pharma companies have since identified opportunities to develop more direct relationships with physicians and with consumers. Pharmaceutical companies have

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long-term plans, they have products that take a long time to develop, a long time to test to get approval for, and then market, and they have a shelf life. But technology moves so much faster than that. So the industry as a whole has had to adopt to the speed of technology, which is not something it always has been set up to do.

CAPRITTA. As recently as 18 to 24 months ago, companies were more willing to throw money at the Internet, because it was a new idea and it was something they thought they had to have. Today pharma companies are starting to put more rigor behind making decisions about how to spend money. The question of ROI has finally come back to the interactive group, we're back to where we should have been all along — being smart about how we spend money. We can't just spend money on interactive because it's fun, which is how the interactive business grew up in the past six or eight years. Nobody is thinking that way anymore.

CROSS. There's a lot of talk about return on investment for products marketed on the Internet. There are ways to track physicians or track consumers, by assessing prescribing habits or tracking compliance. There's been a strong emergence of measurements, but where a lot of companies have been struggling is to come up with a way to combine these different measurements into something that truly gives them an indicator for ROI.

RUNGE. We are running pilots on disease portals. We are creating what we call lightly branded sites, there's no product brand name on the sites. We are providing health and disease information to both physicians and patients in separate sections of a Website. One of our goals as a company is to become a source of good information for patients. We know patients don't search the Web for Aventis.com and they don't search the Web for Allegra.com, certainly not without a lot of promotion. Disease portals act as the large end of a funnel. We believe that if we funnel patients in through disease and health information sites, and they have a positive experience with Aventis, then ultimately they will make their way to more specific sites. Does this get us scripts? Probably not. But did it expose patients to what is a very new company? Probably. We are trying to establish our name and establish our place in healthcare and we think disease portals are a good way of doing that as part of a total Web presence. This is one way for us to say to our customers that we care about more than just how many pills you buy.

NASHED. We put the first pharmaceutical banner ad on the Internet for physicians in 1995. Pharmaceutical companies have never really spent large dollars in this area, however. They've moved very slowly in this area because the industry is very conservative and very regulated. Ironically, there are no solid FDA rulings or guidances for them about using the Internet. Pharmaceutical companies view the Internet as more risky because of that, but we are seeing increased usage — people are sold. On the consumer side, most product managers are fairly convinced that the Internet is a more cost-effective means for them to reach targeted consumers. What we're able to do on the Internet is provide targeted ads, meaning we can show the ads only on pages that are related to a certain disease. One of the problems with the Internet, and one of the reasons why pharma companies are advertising on TV, is that the reach is still limited. Advertisers can reach 30 million people on TV, but on the Internet they can only reach 1 million or 2 million people for a particular disease. That's why we are partnering with other companies, such as ATT Worldnet and Earthlink, to increase our reach in promoting sponsored disease centers. On the professional side, marketers have the problem of limited time and exposure to physicians, both in the education area and detailing. The Internet allows them to reach physicians when these doctors may be more receptive to messages.

JAMES. In the last year or so, our emphasis has been on leveraging the Internet to hook up all our remote clinical sites, which would take time off the clinical process. That's difficult because we don't control all our partners in terms of contract research organizations. But the technology is getting to the point of really being able to handle it.

DUNBAR. We started e-Lilly in August of last year. The intent of e-Lilly is to help catalyze the transformation of both internal and external processes. So it is engaged at different points of the value chain. For example, Lilly has developed InnoCentive.com, which is a Website that allows us to do a form of outsourced research and development or opensourced research and development. We place a bounty on the site for chemical compounds that are in process with us, and invite gifted chemists to take a look at those compounds and come up with novel ways of making them. InnoCentive was launched at the end of June this year and already has paid out some bounties. This is one of the most innovative things any company has done on the Web in science.

Developing a Company Commitment to IT

LASZLO. The biggest issues are not technology focused. Rather they revolve around getting people within the company to sign up and support the IT initiative and understand what the payoffs can be. There's a lot of education that needs to go on, lots of evangelizing, to get the appropriate buy-ins. We specialize in helping clients with adoption issues, not just with the implementation of a particular IT solution. We help to get them past the natural resistance to change and we try to find ROI justifications that they can help sell the project to management.

WIEHE. Mergers within the industry have created what I describe as technical chaos. There are a lot of old legacy systems around, there are a lot of different pieces, and it requires a lot of time, energy, and money to link up all those pieces. The cost of putting a new system or new technology in place and then connecting it to all of the old systems sometimes costs more than investing in a whole new technology.

GRATZ. We are being asked to deliver basic and comprehensive solutions. What we try to bring to bear is a cross function of teams — marketing teams and interactive teams. We can combine offline with online to link content to strategy. Combining those two things, seamlessly, we can help clients have a much stronger presence within the market and reach the audience they are trying to target.

JAMES. From an IT perspective, staffing for success and building a winning culture are important challenges. Picking the right technology in this particular business is critical, in particular as we have a number of niche IT providers. At P&G there's a strong emphasis on making sure there is a solid ROI on our technology investments. The last thing is driving innovation. Not just introducing knowledge and collaboration tools, but making sure from the people standpoint that we can really leverage the technology and data provided.

FADEM. We are focused on our ERP program — enterprise resource planning — an integrated system that goes across all the business functions and ties those business processes together in a standardized fashion. Technology is actually the easiest part of the program. The real challenge is standardizing business processes and getting clarity on roles and responsibilities of operating units. If a company can do that, it can very efficiently provide support for business processes. We would match our ERP program against any company's in terms of what we've been able to accomplish, the cost, and our success. We have not stubbed our toe or blown ourselves up yet.

CROSS. We can see how technology can affect the physician, managed-care organizations, and manufacturers. But, to be able to have an

> The core problem of integrating systems isn't with the technology, it's about integrating people and processes.

GREG BARNES NELSON

> The area that is going to have the biggest impact and the one that continues to be the most challenging, is getting clinically oriented systems in the hands of the front-line workers and replacing all the myriad paper forms and activities that currently persist in probably 90% of the patient population.

JOHN MCILWAIN

> ROI reduces the cost of traditional data management and monitoring. Even at this late date, many companies don't really understand how much they spend on individual programs.

PAUL BLEICHER, M.D., PH. D.

understanding of how the company's objectives fit in is a complicated process. Knowledge sharing within pharmaceutical companies is a major challenge. It's not so much about the technology, but about what kind of knowledge is to be shared and why it needs to be shared.

LASZLO. Mergers have certainly created a major IT consolidation headache that may take years to iron out. But even within companies that have not been caught up in the merger frenzy, there are separate divisions that have done their own thing in the IT arena. In stark contrast, pharma companies now are looking to build shared infrastructures with enough flexibility to allow individual differences to be accommodated within each division so the end users don't suffer. The big fear, of course, is that once divisions start to collaborate on shared services they will lose control and potentially see their business unravel. There needs to be the assurance from the company that individual needs are properly addressed.

BLEICHER. Pharmaceutical companies have created valuations on Wall Street and expectations that require them to produce blockbuster drugs on a more or less regular basis and two or three chemical entities every year,

but very few of them are really able to meet those expectations. Companies need to eliminate the compounds that don't work early and concentrate efforts on the ones that are going to make it in the process, and do this with only a modest increase in the number of people. So they are turning to information technology to answer that challenge. Specifically, companies have to find a way to eliminate the delays that sneak into the process. Those delays are predominately related to data access. Data that should be available for decision making, whether it's operational decision making or safety and efficacy decision making, are typically delayed by months. Therefore their decision making is delayed causing inefficiency in the process. Drugs that should be killed earlier continue as the living dead for some period of time.

NELSON. In any data warehousing or data support application the problems are 90% political and 10% technical. The technology problems are getting at data, understanding the business roles that form data, and applying the data in such a way that people can make decisions. The core problem of integrating systems isn't with the technology, it's about integrating a company's people and processes.

At P&G because we are small and flexible we are able to move relatively quickly.

ROBERT JAMES

We are doing an enormous amount with e-technology capabilities on a global basis. We are leveraging e-technology to deal with global pricing and global inventories. We are very committed to innovation that changes the way in which the company will operate, not only today, but in the future.

BRUCE FADEM

Our charge is to integrate technology rapidly within a very conservative industry and a very conservative company.

MICHELLE RUNGE

Connecting to patients and the physicians

GRATZ. Clients are definitely segmenting who their target audience is. Part of the trend is how to select information about the segment and then capitalize on it by marketing specifically to a group so promotional campaigns are much more effective.

RUNGE. We have a broad set of initiatives all relating to the power of connectivity. We don't just look at improving connectivity between us and our customers, we also have a project that is dealing with the relationship between the physician and the patient. This is where we further our goal of changing or reshaping those relationships. Our product MyDocOnline, an Internet-based communications platform for physicians, was designed specifically to enhance the physician-patient relationship and to enhance the connectivity. I want to stress that we are in no way coming between the physician and the patient.

FADEM. We have a substantial commitment in e-detailing programs. We have a relatively sophisticated network of product Internet sites. We have a very sophisticated Website specifically for our vaccine business. The site provides general information on vaccines, in addition it allows physicians to order vaccines online. That's our single-biggest commercial site for e-commerce.

DUNBAR. As we look out into the next year or so, one of the areas of real emphasis for us will be customer-facing systems. There is increasing emphasis in the pharmaceutical industry on the end consumer. This is a really interesting point in our industry. Ten years ago, the industry didn't really do a great deal around the ultimate patient. We didn't have television ads to any great extent and we did not have the Internet providing information to the end consumer. Over the last five years that's all changed dramatically. But five years in terms of understanding the consumer interface is actually a relatively short time. The pharmaceutical industry is just beginning to understand that customer or consumer relationship. We hear terms like CRM all the time, I think many of the people who use that term can't yet spell it. Customer relationship management, CRM, is a complex and intricate practice that will take time to develop, even among the very best companies in our industry.

The future of technology applications

MCILWAIN. The area that is going to have the biggest impact and the one that continues to be the most challenging, is getting clinically oriented systems in the hands of the front-line workers and replacing all the myriad paper forms and activities that currently persist in probably 90% of the patient population. There will be a variety of technology mediums that can support that function — voice recognition, hand-helds, wireless — those are all means to a functional end, which is getting those clinical systems in place.

RUNGE. We were early into mobile health. We were one of the few companies to try different applications. Mobile health is large universe of connectivity, which includes handhelds, it is all the ways we can provide healthcare to patients using all the latest technologies, including set-top boxes, imbedded technology, wearable technology, and low-tech home technology that connect the physician, patient, healthcare providers, and managedcare. We are right on the brink of having doctors start to realize the power of all this.

CROSS. There are technologies that are emerging that are going to revolutionize the industry, but at the same this is happening, companies have to learn from the mistakes they may have made in the first few years of this technology revolution.

CHRISTENSEN. One of the unique things about Gravity Shift's technology is that we can take content, run it through our instructional design process, enter it into our content engine, and deliver it to just about any application platform. Our process takes a step back from delivery platforms and concentrates on the content. So in a sense, we've taken a neutral approach to delivery. However, our engine allows us to package that information for virtually any LMS, Web application, PDA, etc. We can manage and deliver the same content to multiple platforms — create once, deliver many.

NASHED. One interesting area will be voice technology. There are voice portals, in which somebody can call a number and literally talk to a computer interface. One of our clients will be launching a Website that includes a voice portal carrying our health content. Consumers will be able to access our content via the phone.

COADY. We are involved in structured vocabulary. Because healthcare vocabulary is rich in synonymy, it's frequently possible to say the same thing in many ways, for example kidney failure and renal failure could mean the same thing depending upon the context. But a

computer would have a very difficult time understanding that those were the same. Increasingly, we are trying to extract information from portions of the electronic medical record. We are doing work with people who support clinical research organizations, with value added extraction from free text. A company would be particularly interested if it could discover an additional or alternate use for a drug that was undergoing trials. In the past it seems that this was spotted because people were reviewing the forms and noted something and attempted to develop a correlation that way. But that's not terribly efficient. If one could encode all the different ways that people were describing something, then there's a higher probability of observing a statistical correlation. Because we can do that in multiple languages the system can accommodate studies that are simultaneously being operated at a variety of geographic sites.

WEISSBERG. A growth area that is really important, which has not been fully tapped, is the electronic medical records market. About 8% of the physician market uses an EMR, that is definitely going to grow, for various reasons, one being HIPAA. Another is the move to a systematic approach to healthcare, where everything becomes part of an integrated delivery system. The concept of a virtual EMR that is available across the board at any time is definitely a growth area. Wireless technology is very complimentary in healthcare right now, just from shear mobility purposes. Wireless technologies are really getting involved at the point of care. About 20% of physicians are using wireless devices to reduce paperwork, speed up claims processing, and reduce medical mistakes.

LASZLO. We don't know right now whether cell phones that have PDA capabilities or other wireless technologies are going to be the most widely used medium by anybody and everybody. Some technologies are going to be appropriate for one user group and another technology will be appropriate for another user group. And there are technologies that we haven't even thought about that will inevitably come on the scene, whether we want it or not. What really matters is if we are able to put any of these technologies at the service of real business problems.

RUNGE. We are doing a form of wireless messaging and we are sponsoring ePocrates, which is the largest physician user-base of hand-held applications, with 100,000 physicians. As a sponsor, we help the physician to get to databases, it also helps our sales representatives gain time and credibility with the physician. Physicians are hot on hand-helds, but the difficulty is what will the technology be, I don't think anybody can answer that right now.

JAMES. We just went through a major global investment in hand-held technologies for our salesforce. It's going to make a major difference in productivity savings, particularly in North America where the paper-based sampling process we've just replaced was complex and time consuming. We are looking to streamline such processes, which will benefit the salesforce as well as physicians in terms of information exchange. The next logical step for us is to go wireless, which means people don't have to go home to replicate their data. Voice recognition is another future area we are excited about. It's very clear from talking to physicians that when voice recognition works and they can communicate what they need to, and that information can be translated into prescriptions or other data, we will overcome barriers in terms of technology adoption by our customers. There are obvious productivity savings with hand-held, wireless, and voice-recognition devices not just applicable to the pharmaceutical industry that make for an exciting future.

FADEM. We have specific business applications that are focused around hand-held devices, and in those cases we have a fairly sophisticated functionality and a support structure. That whole marketplace will continue to see a major technology change, not just in pharmaceuticals, but across all industries. As a large corporation, we really want to make sure that the product we are supporting is the product that is going to have some stability for a period of time. PDAs and cell phones are clearly moving closer and closer together, the convergence of those two devices, is the device that we want to support.

BLEICHER. We bought a company earlier this year that delivers hand-held solutions for collecting patient information in clinical trials. There are three possible uses for this technology. One is for collecting patient information, the second is for collecting physician entered information, the third is as a management tool. We are very committed to this technology for patient diaries, and it's been very successful for us. Hand-helds allow us to get high-quality information in a setting where the information is usually degraded and almost unusable.

JAMES. If we're talking innovation, then I have to talk about bioinformatics, genomics, proteomics, and related areas. I believe this is one of the biggest opportunities in our industry where IT can help revolutionize the way research is done. The challenge is to efficiently provide access to a vast and rapidly growing network of scientific data, predominately driven by recent scientific breakthroughs, for example, the human genome project.