



healthcare

CONNECTING THE AGILE BUSINESS

Microsoft
.net

connecting

HEALTHCARE AND LIFE SCIENCES ORGANIZATIONS



Ever-expanding regulation. Shrinking margins. Spiraling costs. Consolidation. Many of the business challenges facing the healthcare industry can be addressed through better use of resources—specifically, information resources. From automated billing systems to electronic patient records, information technology has already enabled the healthcare industry to make incremental progress toward reducing costs and increasing quality. But the opportunity exists to accomplish much more.

Today, information workers in the healthcare ecosystem—including providers, pharmaceutical and medical device companies, and health plans—are typically able to access only fragments of information. Individual applications, such as a hospital's billing, laboratory, radiology, and patient charting, often can't interoperate even within an organization, much less between organizations. To achieve the agility needed to better serve consumers, healthcare entities must develop flexible, adaptable IT architectures that fluidly connect applications and information assets across enterprise boundaries. Such integrated solutions will also enable organizations to automate many critical processes, achieving greater reliability at a lower cost.

But integrating information systems is just the first step toward enabling great innovations. Moving forward, the real power and promise of software-

In providing their organizations with such solutions, IT departments are increasingly moving from their old role as cost centers to a new role as strategic assets to the business. Instead of being seen as barriers to change, IT departments are becoming drivers of business change and innovation.

And an easy and cost-effective way to create the innovative solutions needed for success is through Microsoft software. Today, healthcare and life sciences organizations are using Microsoft technology to improve quality of care, reduce costs, and increase efficiency. For example:

- **Washington Hospital Center**, the largest private teaching hospital in Washington D.C., created Insight, an automated central data repository that enables physicians and nurses to access patient information at the point of care on a Tablet PC or Pocket PC.
- **Merck & Co** needed a solution that would enable it to study the use of its products once they are on the market. The company wanted a solution that would ensure accuracy and compliance with standards while also embracing both legacy systems and new technologies. Merck used Microsoft® Visual Studio® .NET to create a flexible, streamlined architecture that not only meets all of its current objectives, but also will enable the company to rapidly develop new solutions in response to changing industry needs.
- **Delta Dental** of Missouri created a Web-based dental claims administration system that processes 76 percent of claims automatically (up from 8 percent); allowed a 30 percent decrease in claims department staff, despite a 25 percent increase in claims volume; reduces average claims turnaround time from 12 to 2.8 days; and saves more than \$500,000 a year in operating expenses.

The \$90 billion the healthcare industry currently spends in administrative costs could be slashed to \$5 billion or less by moving from a paper-based system to an integrated digital system.

driven innovation will be realized in the area of human activities and business practices. By reducing the complexity inherent in the industry and providing healthcare information workers with ready access to all the information they need—when, where, and how they need it—innovative software solutions will help them form new insights, make better decisions, react more rapidly to change, coordinate resources more efficiently, and accomplish more in less time.



the challenges

OF HEALTHCARE AND LIFE SCIENCES

Creating a .NET-connected solution that enables claims to be submitted over the Internet can lower the per-claim transaction cost from the current \$20 to about \$0.20.

One of the biggest challenges facing the healthcare industry today is the need to reduce costs. Healthcare costs are increasing at between 13 percent and 17 percent each year. These increases are unsustainable. Increasing productivity and operational efficiency can help healthcare entities curtail these steep increases.

All sectors of the healthcare industry are feeling the pressure to control costs. Providers are experiencing declining profitability due to reduced

One way to reduce costs and improve efficiency is by replacing outmoded, paper-based methods with streamlined digital systems. Approximately 70 percent of healthcare transactions today are paper-based, resulting in administrative costs of up to 20 percent of each dollar spent. In the U.S. alone, the yearly cost of processing and administering claims is about \$90 billion. In addition to the cost of manually filling out all this paperwork, the process is often fraught with



reimbursements and increased operational costs. Pharmaceutical companies may spend more than \$800 million to bring a new therapy to market—and the success rate is only about one in 5,000 compounds. For health plans, medical and business costs continue to increase each year; labor costs are growing, and making changes to existing systems is labor-intensive and expensive—as is designing and rolling out new products to satisfy the growing consumer-driven market. Finally, all sectors in the industry are facing increasing costs associated with regulatory compliance.

errors—as well as with the risk of exposing confidential information. Improving the efficiency of these processes could dramatically lower healthcare costs.

The Integration Imperative

Another way to reduce costs and improve efficiency is to integrate information across different systems and organizations. The key is to find ways to make complete information easily accessible, whenever and wherever it is needed.

In the case of physicians, for example, having ready access to complete patient information—including lab results, medication history, and specialists' reports—would significantly improve their ability to specify treatment plans that improve clinical outcomes.

In the case of hospitals, the information fragmentation problem often stems from IT systems that are unable to communicate with one another. The average hospital runs over 200 different systems—and often none of them can typically communicate with any of the others. This lack of interoperability, which results in duplication of information as well as difficulty in accessing needed data, affects both the efficiency with which care is delivered and the quality of care.



Pharmaceutical researchers are often overwhelmed by having to navigate multiple information sources, each locked away in a separate application “silo.” Integrating these vast resources and improving collaboration would clearly shorten the drug discovery and development process.

Health plans are similarly hindered by fragmented information. On the employee side, the problem manifests itself in numerous ways, from the inability of project teams to easily share information to lengthy customer service calls as representatives are forced to move between multiple application screens to answer a customer’s questions. On the systems side, health plans, like hospitals, often have many different systems that are unable to interoperate. For example, an insurer may have a mainframe system for handling

Medicaid claims that can’t easily exchange information with the mainframe system it uses for processing other claims. Providing easy, security-enhanced access to an integrated information repository and enabling discrete systems to interoperate would address both types of information fragmentation. The resulting efficiency improvements, in turn, would help solve many of the challenges faced by health plans, speeding the rollout of new healthcare products, reducing operational costs, and improving customer service.

Microsoft is dedicated to delivering innovative software and solutions that can help our healthcare and life sciences customers overcome these challenges.

solutions

HOW MICROSOFT SOFTWARE CAN HELP

Microsoft solutions available today can help your organization realize its full potential through innovations that enhance productivity, are simple by design, and deliver greater value to your customers. Across all segments of the healthcare and life sciences industries, Microsoft solutions are enabling organizations to reduce costs, improve quality of care, and respond quickly to regulatory and market changes.

Reduce Costs

Some healthcare industry analysts believe the \$90 billion the healthcare industry currently spends in administrative costs could be slashed to \$5 billion or less by moving from outdated modes of communication—such as paper, fax, and phone—to streamlined, online systems.

WEB SERVICES

What are Web services? If you ask a developer, you’ll hear something like, “self-describing software modules, semantically encapsulating discrete functionality, wrapped in and accessible via standard Internet communication protocols like XML and SOAP.”

If you ask a business leader who has implemented Web service-based solutions, you’ll hear a different kind of answer: Web services help the business connect with customers and partners; they enable the business to extend existing services to new customers; they unlock information so it can flow to every employee who needs it; they reduce development time and expense for new projects. You’ll hear less about what Web services are and more about what they enable the business to do.

In the provider segment, for example, hospital pharmacies can reduce administrative costs with HospitalPharma.com, a Microsoft .NET–based online portal developed by **PharmiWeb Solutions**. HospitalPharma.com provides a one-stop shop for information on pharmaceutical suppliers, their drugs, and services. For example, a hospital pharmacist could use it to research details of a particular drug, from pricing through molecular structure, and combine this information with downloadable materials such as technical white papers and patient information resources. By delivering aggregated content from a wide variety of sources through a single portal interface, HospitalPharma.com saves pharmacists the time of having to access the stand-alone solutions of individual pharmaceutical companies.

In another case, **Temple University Health System** broke a pattern of 20 percent annual jumps in pharmacy costs by replacing physicians' prescription pads, formulary guides, and reference books with wireless Pocket PCs loaded with TouchWorks™, a suite of point-of-care applications from Microsoft Solution Partner Allscripts Healthcare Solutions. Now when a doctor chooses a brand-name medication, the system offers equivalent generic choices when applicable (which is about 28 percent of the time).

In the first six months, the solution increased the use of generics from 40 percent to 52 percent of prescriptions. By the second year, Temple expects to save \$500,000 a year—as opposed to the previous trend of a 20 percent increase a year. The solution also reduces the chances of medication-related errors and offers a lightning-fast avenue for notifying physicians in the event of an emergency, such as a drug recall. In fact, the safety net offered by the solution helped Temple negotiate a 10 percent reduction in its malpractice premiums.

In yet another case, developers at the **M.D. Anderson Cancer Center** combined iSite®, a medical imaging system from Microsoft Solution Partner Stentor, with an in-house developed database using Microsoft® SQL Server™ 2000 and Microsoft® Windows® 2000 Advanced Server, to create a comprehensive imaging management system. By eliminating the inefficiency and overhead associated with the previous paper-based patient charts and



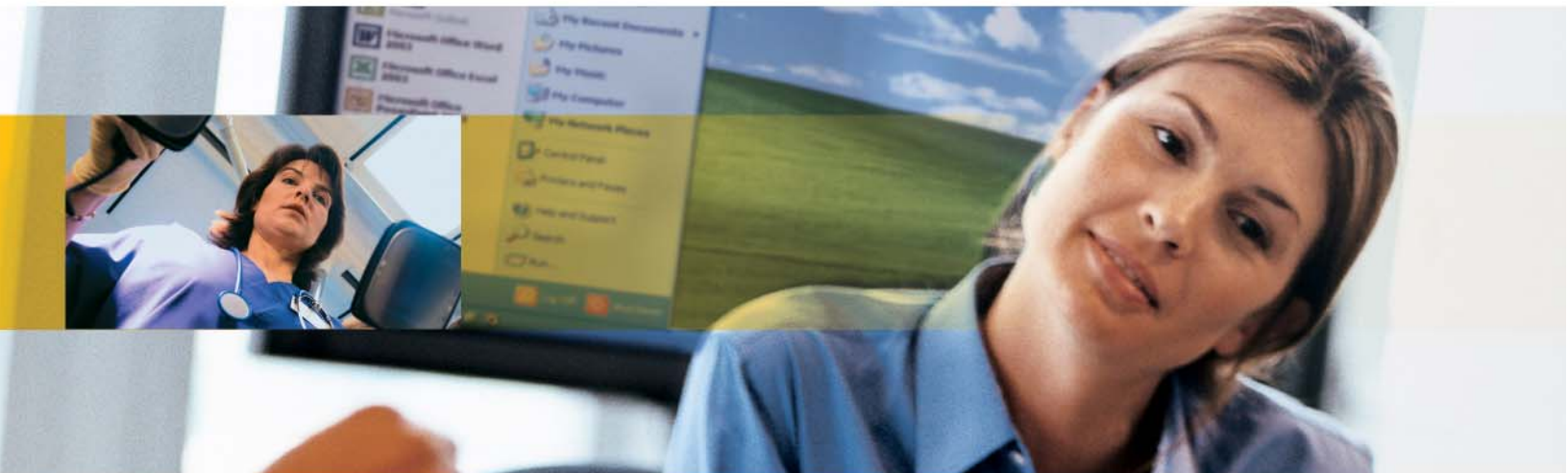
film-based diagnostic images, the solution is expected to generate savings of \$30 million over the next eight years. In addition, by enhancing collaboration among clinicians, the solution is improving the quality of care.

In the pharmaceutical segment, **Merck & Co.** developed a solution that is cutting costs by streamlining the clinical trials process and automating many trial management functions. The application, which integrates not only leading-edge vendors but also legacy systems, helps ensure that the company meets all applicable regulatory requirements, improves data collection accuracy, and accelerates time to completion. In so doing, it lowers the cost of getting new drugs to market and shortens the cycle time, so the company can start generating revenues sooner—all while maintaining the high quality that Merck demands from its clinical research. And, using the Microsoft platform, developers were able to complete the solution in just one year—not the five years that they initially estimated.

DataLabs' Clinical Trial Management System,

based on innovative Microsoft software, also helps lower costs and improve efficiency by integrating research information. The system, which is the first fully integrated trial-management product in the biopharmaceutical industry, makes trial data readily available in a common repository while studies are still under way, helping researchers to both spot potential safety issues and identify positive results sooner. By enabling researchers to consolidate, analyze,

Another example is **Molina Healthcare, Inc.**, a fast-growing California-based healthcare company serving more than 450,000 members in four states. One way in which Molina is expanding its managed care program for Medicaid recipients is by acquiring new plans with existing members. To serve everyone effectively, Molina needs to be able to bring new plans online quickly while controlling claims administration



integrate, and process data, both within and across clinical trials, while the trials are still in progress, the solution lowers drug-development costs, reduces time to market, increases efficiencies, and enhances the quality of research.

Health plans represent another segment that is cutting costs with applications based on the Microsoft platform. For example, the **Delta Dental .NET**-connected benefits administration application cited earlier saves the company more than \$500,000 a year in operating expenses, as well as another \$2 million per year in service bureau fees.

costs. The company used a claims administration system from QCSI, a Microsoft Solution Provider, together with several Microsoft technologies, to create a platform-agnostic solution that reduces plan administration costs, enhances the company's ability to expand into new markets, and improves its service to both providers and members.

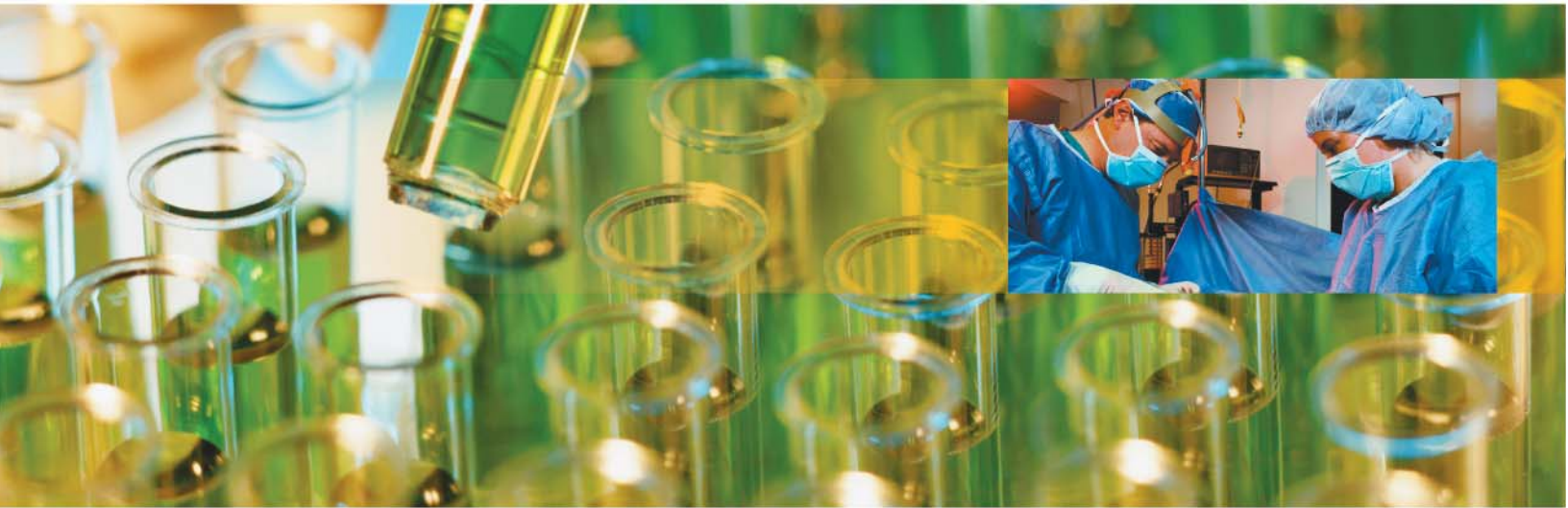
By the second year, Temple University Healthcare System expects TouchWorks to save \$500,000 a year in prescription costs—as opposed to the previous trend of a 20 percent increase a year.

improve

QUALITY AND EFFICIENCY OF CARE

A recent Institute of Medicine report noted that up to 98,000 patients die annually in U.S. hospitals because of preventable medical errors—at an estimated cost of \$9 billion. That's the equivalent of one jumbo jet crash

its healthcare professionals with quick and easy access to complete patient histories—wherever, whenever, and however they need it. The new system has reduced medical errors at Sutter, enhanced efficiency and collaboration, and improved clinical outcomes, enabling Sutter to deliver a higher quality of care across the organization. Best of all, Sutter was able to accomplish all this on a hardware platform that was one-fourth the cost of alternative platforms, achieve a \$150,000 reduction in annual database and hardware support costs, and realize an ROI within 18 months.



With blockbuster drugs generating sales of \$6 million to \$12 million or more per day, every day the company can eliminate from the trial process through greater efficiency can result in millions of additional dollars in sales.

every single day. If physicians had immediate access to integrated patient information, they could significantly improve the quality of healthcare.

Sutter Health, encompassing more than 20 hospitals and more than 33,000 employees in Northern California, has taken steps to provide physicians with such integrated data. Using the Sunrise XA™ clinical information system from Microsoft Solution Partner Eclipsys, Sutter created a comprehensive clinical records system that provides

Similarly, **PACLAB Network Laboratories**, a partnership of five major healthcare organizations in the Pacific Northwest, was able to use Microsoft technologies to rapidly and cost-effectively create a portal that enables the five hospitals to share patient test result data—even though each uses its own system for registering and admitting patients and its own laboratory information system. By consolidating inpatient and outpatient test results across all five hospitals into a single view of the patient, the shared portal enables healthcare professionals to access all lab reports with a single sign-on. The portal is based on the Microsoft Clinical Portal Solution developed by Microsoft Solution Partner Capgemini. The combination of secure Web services running on a secure Microsoft® Windows Server™ 2003 network enables the new application to fully comply with

HIPAA privacy requirements. As a result of the shared portal, PACLAB hospitals are able to present more complete medical histories to clinicians, resulting in improved patient care and a reduction in duplicate orders. The Microsoft platform also enabled developers to deliver the solution in less time than previous applications—and at a lower cost.



respond

QUICKLY TO REGULATORY AND MARKET CHANGES

Since many aspects of Microsoft technology—from Web service support to rapid application development technologies—enable companies to make changes quickly, healthcare organizations are able to anticipate new trends in healthcare and deliver strategic IT solutions more rapidly than before.

One packaged solution that helps companies comply with regulatory requirements is PharmaReady™, an electronic document management system from **OnSphere**, a Microsoft Gold Certified Solution Partner. The solution, based on Microsoft SharePoint® Portal Server 2003, fully complies with 21 CFR Part 11 and is designed specifically to help pharmaceutical, biotech, healthcare, life sciences, and clinical research organizations manage standard operating procedure and validation documents.

Examples cited earlier—from the Merck clinical trials management application to the Molina claims administration system—also help healthcare organizations comply with all applicable regulatory requirements by automatically checking all actions against the appropriate regulatory requirements and notifying the user if there is a problem.

healthcare

SOLUTIONS TODAY AND TOMORROW

Microsoft solutions available today can help healthcare organizations build, host, deploy, and use solutions that will reduce costs, decrease complexity, increase productivity, and deliver greater value to patients and customers. By helping healthcare workers conduct business more easily and effectively—and providing them with the information they need, when and where they need it—innovative Microsoft technology empowers all segments of the healthcare ecosystem, helping them achieve their full potential.

- **For providers**, this means bringing data to the point of care, where physicians can see the latest lab reports, access electronic medical records, and electronically enter prescriptions from a handheld device, such as a Pocket PC or Tablet PC. It also means enabling the free flow of information throughout the continuum of care, so caregivers and consumers can access all relevant clinical data when making medical decisions.

MICROSOFT .NET

.NET is the Microsoft Web services strategy to connect information, people, systems, and devices through software. .NET is integrated across the Microsoft platform, providing the ability to quickly build, deploy, manage, and use connected, security-enhanced solutions with XML Web services. These solutions enable faster, more agile business integration, and the promise of information anytime, anywhere, on any device. The Microsoft platform includes everything a business needs to develop and deploy a Web service-connected IT architecture: servers to host Web services, development tools to create them, applications to use them, and a worldwide network of more than 35,000 Microsoft Certified Partner organizations.

“The big benefit we’ve had from .NET is the ability not only to reduce cycle time, but also to maintain quality. Our core business is clinical research, bringing the best product we can to market. Visual Studio .NET and the .NET Framework make this possible.”

– Jim King,
Manager of Technology Research and Development, Merck & Co.

- **For pharmaceutical and medical device companies,** it means improved drug discovery cycles, shortened clinical trials, accelerated approvals, increased operational efficiency, improved sales and marketing, and the ability to seamlessly link with contract research organizations, regulatory agencies, clinical study sites, and business partners.
- **For health plans,** it means the ability to more effectively manage and act on data flows to and from multiple sources, resulting in better management of claims payment, rate setting, pricing, marketing, care management, prescription benefits, eligibility verification, clearinghouse transactions, and referrals.

By using solutions built on Microsoft technology, organizations across the healthcare ecosystem can improve healthcare delivery. Not only will they save money through more efficient operations, but they will also be able to make better decisions, provide patients with better care, and improve their customer service.

With more than 35,000 certified partners and a broad range of healthcare solutions, Microsoft and its partners are uniquely positioned to help you take immediate advantage of all the benefits the Microsoft platform has to offer.

looking ahead

Future advances in the Microsoft platform will enable healthcare organizations to take additional steps to reduce their costs and improve their quality of care.

Cost Savings

New ways of storing data will offer one avenue for helping healthcare providers to reduce their costs. For example, instead of filing faxes in physical folders, provider administrators will be able to file a single fax in a host of virtual collections, using OCR (optical character recognition) capabilities and metadata to automatically associate the fax with the patient through the patient’s Social Security number. That way, if someone is looking for a fax from the patient’s insurance company, it will come up whether the person searches on the patient or on the insurance company.

Future enhancements to the Microsoft platform will also provide additional efficiencies and cost savings for pharmaceutical companies. For example, one factor that can delay the completion of clinical trials is patient enrollment. The next version of



Windows will offer fundamental improvements in operating system security, performance, presentation technologies, and storage technologies that will help address this problem.

As a result, pharmaceutical companies will be able to supply clinical investigators, at their request, with an application that will notify them of clinical trials coming up in areas of interest to them. When a participating investigator brings up a research article, the application will be able to use metadata associated with the article to identify any clinical

trials that the company is conducting on that subject. If the investigator is interested in participating in any of these trials, the application will download the protocol's inclusion and exclusion criteria to the investigator's desktop to assist with screening patients

Quality of Care

The next version of Windows will enable healthcare organizations to further improve quality of care. For example, consider a physician who wants to consult with a radiologist in another city regarding a patient's x-ray. Currently, a number of technical issues make this difficult to do online: the need to provide appropriate security to protect patient data privacy, the difficulty of transmitting large images, and the complexity of installing the necessary viewing software, to name



for possible participation. The application will also be able to de-identify the records of any patients selected and send the now-anonymous data back to the sponsor company for consideration. In this way, clinical investigators and pharmaceutical companies will be able to collaborate to shorten the time required to locate participants in clinical trials.

just a few. The next version of Windows, however, will address these problems. Instead of transmitting the full x-ray image, specialized viewing software at each end will throttle the bandwidth usage and make it efficient for each physician to pan and

zoom as they discuss details. When the radiologist clicks on the image, viewing software will install itself seamlessly, without any confusing prompts. A split-screen image on each doctor's machine will show both doctors' views of the x-ray image. Each doctor will be able to zoom, pan, and annotate the image as they communicate through a chat window, passing messages back and forth using a publish-and-subscribe model. The application will also help protect data privacy—both by verifying that the doctors on both ends of the exchange are trusted entities and by using cached public key credentials to encrypt the messages passed back and forth.

history so she can apply for a life insurance policy. In e-mailing her the file, the provider can add DRM protection and name the patient as administrator, giving her rights to the information for an unlimited period. When the patient then e-mails the file to the life insurance underwriter, she can also apply DRM protection—this time making it a read-only file that can be opened only by the addressee, and only for 30 days. The combination of DRM and encryption messaging technologies will help ensure that sensitive information won't fall into the wrong hands.

a platform

FOR THE FUTURE

Healthcare and life sciences organizations around the world are building for the future on the Microsoft



Trustworthy Computing

The next version of Windows will further enhance trustworthiness with built-in digital rights management (DRM) capabilities. For example, suppose a patient requests a copy of her medical

platform today. In doing so, they free employees from routine tasks so they can add greater value to the organization, gain insight into consumers and operations, and capture processes to improve efficiency and comply with government regulations. Microsoft technology helps organizations rapidly build, deploy, and maintain solutions that support constant interaction and outreach with consumers, partners,

and employees. Collaboration, application integration, and customizable content are built into a single platform, enabling organizations to enhance consumer satisfaction, strengthen partner relationships, and increase overall employee productivity.

Building on the Microsoft platform enables increased connectivity within and across the healthcare landscape, with the ability to integrate Microsoft and third-party technology in modular ways. This approach provides for high degrees of reuse and greater flexibility in evolving applications over time. Microsoft .NET, the comprehensive Microsoft strategy to enable Web service connectivity across its entire line of products and services, plays a key role in achieving these goals. Built on Web service standards, .NET connects a broad range of personal and business technologies, enabling providers, pharmaceutical companies, health plans, and consumers to access and use important information, whenever and wherever it is needed.

Microsoft technology has the advantage of lower total cost of ownership, with performance equal to or better than that of competitive technologies. Healthcare and life sciences organizations can reduce

on existing investments. Microsoft technology also enables information workers to use the familiar Office interface to access data from across the enterprise—an approach that cuts training costs and boosts productivity. Finally, creating new solutions with Visual Studio .NET—a development environment in use by more than 2.5 million developers worldwide—enables businesses to tap into a deep pool of affordable developer talent.

Microsoft offers a comprehensive approach to solutions for healthcare. To provide our customers with even more choice, we work with a broad network of partners whose capabilities and deep industry knowledge supplement our strengths. Our rich partner ecosystem includes more than 25,000 certified partners and more than 250,000 applications built on the Microsoft platform.

For more on Microsoft efforts in Healthcare, please see: <http://www.microsoft.com/healthcare>

MICROSOFT WINDOWS “LONGHORN”

Microsoft is currently in the early stages of building the next version of Windows, codenamed “Longhorn.” It is being designed to provide the foundation for a new industry wave of innovation—ultimately enabling businesses to use technology more effectively, with far fewer barriers, while enabling customers to better realize the full benefits of technology.

Current technologies such as Windows XP, the .NET Framework, and Visual Studio .NET are the first step towards the realization of a new model of computing, one designed around end-to-end experiences that improve the productivity and decision-making abilities of organizations while informing and entertaining customers at home. “Longhorn” continues these advancements as personal computing becomes a powerful asset in the everyday lives of millions of people worldwide.

IT costs by migrating from expensive UNIX platforms to Windows, porting SAP and Siebel applications to Windows, and consolidating servers to reduce cost. In addition, the ability to build on legacy systems, rather than rip and replace them, improves the return



links for more information

The University of Texas M.D. Anderson Cancer Center expected to save \$30 million over 8 years thanks to enhanced efficiency in electronic clinical data and diagnostic image retrieval
<http://www.microsoft.com/resources/casestudies/CaseStudy.asp?CaseStudyID=13288>

Merck & Co. uses Visual Studio .NET and the .NET Framework to integrate with leading-edge vendors and legacy systems
<http://www.microsoft.com/resources/casestudies/CaseStudy.asp?CaseStudyID=13577>

The National Cancer Institute redesigns the cancer.gov site with Microsoft .NET
<http://www.microsoft.com/resources/casestudies/CaseStudy.asp?CaseStudyID=12032>

South Africa and Afrox Healthcare Ltd. save lives with medical messaging solution
<http://www.microsoft.com/resources/casestudies/CaseStudy.asp?CaseStudyID=13657>

Delta Dental of Missouri sees auto-adjudicated claims processing jump from 8 percent to 76 percent, using QCSI and Microsoft
<http://www.microsoft.com/resources/casestudies/CaseStudy.asp?CaseStudyID=12357>

Healthcare Without Boundaries: Pharmaceuticals
<http://download.microsoft.com/download/d/9/5/d95b2f86-4095-4f26-962a-d9af2a5b1e0d/pharmaceutical.pdf>

Washington Hospital Center medical records help physicians and boost revenues while saving millions
<http://www.microsoft.com/resources/casestudies/CaseStudy.asp?CaseStudyID=14967>

Temple University Health System reins in rising pharmacy expenses, cuts risk of medication errors, and improves patient education
<http://www.microsoft.com/resources/casestudies/CaseStudy.asp?CaseStudyID=11828>

PACLAB Web services expedite lab reports, help physicians enhance patient care
<http://www.microsoft.com/resources/casestudies/CaseStudy.asp?CaseStudyID=15026>

Sutter Health gains HIPAA-compliant e-mail without adding to IT support costs
<http://www.microsoft.com/resources/casestudies/CaseStudy.asp?CaseStudyID=15126>

<http://www.microsoft.com/healthcare>



