The Environment:
Redundancy requirement mandated by federal legislation or customer concerns, mergers and acquisitions, technology growth projections that outpace current capacity...just a few of the many reasons that businesses today are reassessing their data center infrastructures. Will you need to expand your data center beyond its current walls, renovate its infrastructure, or build a completely new facility on a new site?

The Trap:
Designing and building data centers are unique projects. The technology requirements mandate a different approach. These projects may not be common to your business and the intricacies are often not understood by design and construction firms that are not specialized in data centers.

Another common pitfall is the failure to recognize the importance of coordinating and managing these engagements with other current and potential business and IT projects.

Perspective:
IBM knows data centers.
- IBM currently operates over 230 data centers successfully worldwide.
- IBM’s 300 million square footage of raised floor space also provides a unique lab environment to determine actual design requirements.

A streamlined approach that identifies elements to consider and risk mitigation plans has been developed through our extensive experience with building data centers.

Value Statement:
IBM’s expertise in technological innovation and leadership and our methodology, high skilled data center specialists and over 30 years of extensive, hands-on experience in designing and supporting data centers provide the thought leadership necessary to plan for the future while reducing the complexity and risks associated with your new data center. Inherent risks associated with building a new data center facility can be minimized by capitalizing on IBM’s project experience and intellectual capital. Risk mitigation areas include:
- Design points with single points of failure
- Under or over sizing of equipment and facilities
- Design limitations for expansion and growth
- Outages caused by improper installation or configuration or by using outdated approaches for design/construction.

Project schedule and cost overruns caused by multiple project changes, communication breakdowns, or project task oversights
- Prolonged outages due to the lack of contingency planning

The Method:

| Strategic Planning | Site Selection | Engineering Design | Build | Relocation |

- Strategic Planning, site selection, designing, constructing, and overall managing of data center builds includes the analysis of the infrastructure elements:
  - Architectural (including Physical Layout)
  - Electrical
  - Mechanical
  - Fire Suppression
  - Security
  - Environmental

IBM can provide assistance with each of the five steps individually, or collectively.

Successes:
Engagements have been completed with clients of all sizes in the Banking and Financial Services, Healthcare, Retail, Communications, Distribution, Education, State and Federal Government, Manufacturing, and other industries.
The Environment:
Current economic conditions are forcing organizations to more carefully scrutinize existing IT operations as business requirements change and fiscal responsibility becomes an urgent necessity. Mergers and Acquisitions, Operational Resiliency/Business Continuity, IT Optimization and efficiency improvements, and mild to radical IT Service Delivery Transformations continue to drive data center relocations and consolidations. In turn, these business critical transitions require the migration of people, workload and technology without negatively impacting service levels and maintaining day-to-day operations. As a result, many organizations find themselves without the available resources and experience to successfully transition to this new environment.

The Trap:
Extensive knowledge and talent exists within many organizations today. There is a tendency to want to relocate or consolidate the IT environment through the use of internal resources. After all, who knows your environment better than your own employees? However, Data Center Relocations and Consolidation events are not regular activities for most companies or organizations. And it is often assumed that the tasks to plan and implement the transition can be added to already existing job responsibilities.

Another common pitfall is the failure to recognize the importance of coordinating and managing the transition engagement with other current and potential business and IT projects within your organization.

Perspective:
IBM manages and executes these transitions every day. A streamlined approach that identifies elements to consider and risk mitigation plans has been developed through our extensive experience with data center consolidations and relocations. We personally understand the value of consolidation efforts as we consolidated 155 of our own data centers to 16 in 1995.

IBM is experienced in working with all hardware, software and tools suppliers and takes an agnostic approach to the technology mix in your environment.

Value Statement:
IBM’s methodology and extensive, hands-on experience can help you make the optimal investments that will deliver availability, scalability, recoverability, and agility throughout your transition. The approach enables you to minimize the inherent risks and complexity associated with migrations of your data center environment, while planning for your future. Key benefits include an efficient and effective transition reflecting the appropriate approach for your business and technology needs. Specifically, benefits include:
- Timely Relocation/Consolidation
- Staying within costs
- Continuing to support business needs with minimal downtime
- Delivering equal or better service to customers

The Method:
A three-phased approach is used for relocation and consolidation efforts.

Phase I designs, plans and estimates the environment to be relocated or consolidated using a detailed assessment of the business constraints and projections as well as the IT environment itself.

Phase II provides the detailed plans needed to ensure a smooth transition and uninterrupted business operations.

Phase III executes the plan and refines it through simulations.

Successes:
Engagements have been completed with clients of all sizes in the Banking and Financial Services, Healthcare, Pharmaceuticals, Distribution, Education, State and Federal Government, Retail, Media & Entertainment, Manufacturing, Insurance, and other industries.
Implementing an efficient, scalable data center solution to support business continuity and growth

IBM IT Facilities Assessment, Design and Construction Services – scalable modular data center for SMB

Accommodating server growth to support your business
Organizations face challenges in ensuring that existing data centers can meet growing business and technology requirements, especially when a company is moving to a new location. Operating servers in a non-data-center environment, such as a server closet, can pose environmental and efficiency challenges—including overheating and insufficient racking and storage. Yet for small and mid-size businesses (SMBs) that are experiencing server growth and have limited capital, it can be difficult to cost-effectively deploy a scalable, small-scale data center in a reasonable amount of time—without negatively affecting business operations.

IBM IT Facilities Assessment, Design and Construction Services – scalable modular data center for SMB helps enable your organization to create a data center in a reduced amount of time—using a kit or package from an IBM-preferred vendor. The result is a solution that not only helps you better manage power, cooling and capacity, which can help control costs, but also provides an efficient method for racking and stacking servers. Additionally, the scalability of the solution means you can more easily add components as server growth and other business needs dictate.

Highlights

- Helps enable timely, cost-effective creation of a ready-made data center
- Provides increased flexibility to install a data center in virtually any environment
- Helps provide scalability to add components while helping you keep costs in check
- Delivers the power, cooling, security and monitoring needed for optimal server performance
Building a data center in less time than typical data center deployments require

Scalable modular data center for SMB helps enable you to implement a bundled, fully functional data center in a reduced amount of time—less time than is needed to build a traditional data center. Building or renovating a data center typically involves building walls, raising floor space and installing an electrical and mechanical infrastructure, including air conditioning. By enabling you to avoid the construction phase and providing you with modular components, such as a rack enclosure, ready power and cooling, and the necessary cabling, IBM helps enable you to take advantage of out-of-the-box data center functionality.

In a time span of about two to three months (versus the typical six to twelve months it takes to build or renovate a data center), IBM can help you determine your data center requirements, and then we’ll work with an approved vendor to design your solution and provide installation and testing services. Plus, IBM can serve as your single point of contact for data center design and build phases. Spending less time on design allows for faster implementation so you can speed time to marketplace.

Installing data centers in a variety of environments

The flexibility of IBM scalable modular data center for SMB allows you to install a data center in virtually any environment—from a traditional data center for a regionalized solution to general office space. The solution’s plug-in functionality and small footprint mean it can typically run coolly and quietly, regardless of where it’s installed.

Using IBM services and the integration of an IBM-preferred-vendor solution, you can take advantage of the necessary tools and resources to help ensure data center security and efficiency. You can install your servers and other components in one physical location under lock and key, helping to improve security. And with everything in a common environment, you can take a more systematic and methodical approach to monitoring and maintaining the power and cooling requirements of your equipment, helping to increase efficiency.

Adding components as your business needs dictate, while controlling costs

Scalable modular data center for SMB allows you to more easily add components—including servers, frames and racks—to expand your data center as your business needs evolve. Because using a bundled solution with all-inclusive pricing facilitates better and consistent budget planning and controlled expenditures, scalable modular data center for SMB can also help you manage costs. Plus, a lesser administrative investment means you can reinvest in other areas of your business.

Providing the capabilities needed to help ensure efficient operations

Scalable modular data center for SMB helps deliver the necessary power, cooling, security and monitoring capabilities for your data center. These required elements can help ensure efficient and reliable server operations and a security-rich environment—giving you peace of mind that your hardware is in an optimal setting. Monitoring the power, heat and capacity of your hardware in real time can help you control costs and reduce total cost of ownership, as well as improve asset management.
Leveraging the expertise of a global technology leader

Scalable modular data center for SMB leverages preferred vendor solutions and IBM’s time-tested server technology, facilities infrastructure experience and deep industry knowledge to help you quickly and cost-effectively create a fully functional data center. IBM also offers a broad range of complementary services, including server consolidation and IT Infrastructure Library® assessment, provided by professionals with more than 20 years of experience in the industry. IBM has acquired experience designing, building and running a significant number of its own data centers, as well as those of its strategic outsourcing clients.

With experience designing and building more than 100 business continuity and recovery sites, IBM has a proven track record in providing resilient data center solutions. IBM professionals possess a clear understanding of existing data center technologies and trends, and can provide that insight as well as high-level support to help meet your solution needs now and in the future. Leveraging its well-established relationships with industry-leading vendors, IBM can tailor a data center solution to your needs, whether you’re looking for a two-, five- or ten-year strategy or beyond. Relying on IBM for your data center needs helps enable you to focus your valuable resources on your core business, rather than on your IT environment.

For more information
To learn more about IBM IT Facilities Assessment, Design and Construction Services – scalable modular data center for SMB, contact your IBM representative or visit:

ibm.com/services
IBM Data Center and Facilities Strategy Services – high density computing data center readiness assessment

Preparing for the new demands of high density technology

Today's enterprises are under increasing pressure to provide electronic capabilities that allow consumers to perform tasks quickly, easily and securely. Supporting these capabilities requires faster, more powerful information technology, a demand that many IT managers are meeting by deploying high density equipment—hardware with great processing power and a small footprint—in their data centers. By consolidating existing servers onto high density technology platforms, enterprises get the power boost they need while lowering total cost of ownership. However, the technology requires a great deal of energy and often creates a large amount of heat. To maintain continuous operations, businesses must ensure that their data centers are equipped with sufficient power and cooling capabilities.

IBM Data Center and Facilities Strategy Services – high density computing data center readiness assessment can help you determine whether your data center is prepared to fully support high density IT—now and in the future. Fusing IBM’s deep technology insight and decades of experience in data center facility design and operations, high density computing data center readiness assessment can analyze your facility's existing capabilities and determine what steps your organization needs to take to accommodate the demands of high density technology.

Helping to navigate growth and expense challenges

IBM’s extensive international reach keeps its professionals up-to-date on emerging industry trends as well as changing costs and risks on a large scale. Utilizing the findings of high

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**Highlights**

- **Offers professional guidance in managing the growth and expense challenges associated with high density technology**
- **Leverages key technology insight to develop plans for necessary remediation**
- **Helps enable continuous operations**
density computing data center readiness assessment, IBM can provide your organization with guidance in successfully navigating the growth and expense challenges of supporting high density technology in your data center facility. With power and cooling costs often representing a large proportion of a data center’s total cost of ownership, having this expert advice can potentially help you achieve significant savings.

**Leveraging technology insight to create a blueprint for remediation**

Decades of experience in data center facility design and operations have provided IBM with deep technology insight, particularly into the dynamics between reliably supplying power and effectively removing the heat generated by that power. Drawing upon this knowledge base, high density computing data center readiness assessment can examine the entire interdependent power and heat removal supply chain, providing a comprehensive evaluation that forms the basis of recommendations for any necessary remedial measures.

**Working to support continuous operations in a high density environment**

Industry analysts have estimated that by 2008, 50 percent of data center facilities will lack the power and cooling capacity needed to support their high density equipment. But you can be better prepared. High density computing data center readiness assessment can help you determine whether your data center is able to support a high density IT environment without system failures or other interruptions in service. In performing the assessment, IBM consultants analyze your data center’s as-built capabilities and compare these findings to the requirements posed by existing or planned high density equipment, identifying discrepancies that could potentially jeopardize continuous operations.

**Why IBM?**

IBM’s proven track record of successful data center facility design and operations projects spans from the beginning of the information age to the current Internet era. Its dedicated team comprises 450 experts, some with more than 20 years of experience in the field. A key contributor to thought leadership on the emerging issue of increasing power and cooling requirements, IBM is well-positioned to help your organization manage the diverse challenges associated with high density technology.

**For more information**

To learn more about IBM Data Center and Facilities Strategy Services – high density computing data center readiness assessment contact your IBM representative or visit:

[ibm.com/services](http://ibm.com/services)
Healthcare 2015: Win-win or lose-lose?
A portrait and a path to successful transformation

Executive summary
IBM Institute for Business Value
IBM Global Business Services, through the IBM Institute for Business Value, develops fact-based strategic insights for senior business executives around critical industry-specific and cross-industry issues. This executive brief is based on an in-depth study by the Institute’s research team. It is part of an ongoing commitment by IBM Global Business Services to provide analysis and viewpoints that help companies realize business value. You may contact the authors or send an e-mail to iibv@us.ibm.com for more information.
Executive Summary

Healthcare is in crisis. While this is not news for many countries, we believe what is now different is that the current paths of many healthcare systems around the world will become unsustainable by 2015.

This may seem a contrarian conclusion, given the efforts of competent and dedicated healthcare professionals and the promise of genomics, regenerative medicine, and information-based medicine. Yet, it is also true that costs are rising rapidly; quality is poor or inconsistent; and access or choice in many countries is inadequate.

These problems, combined with the emergence of a fundamentally new environment driven by the dictates of globalization, consumerism, demographic shifts, the increased burden of disease, and expensive new technologies and treatments are expected to force fundamental change on healthcare within the coming decade. Healthcare systems that fail to address this new environment will likely “hit the wall” and require immediate and major forced restructuring – a “lose-lose” scenario for all stakeholders.

Change must be made; the choices left to the stakeholders of today’s healthcare systems are when and how. If they wait too long to act or do not act decisively enough, their systems could “hit the wall” – in other words, be unable to continue on the current path and then, require immediate and major forced restructuring. This is a frightening, but very real prospect. Financial constraints, counterproductive societal expectations and norms, the lack of alignment in incentives, short-term thinking, and the inability to access and share critical information all inhibit the willingness and ability of healthcare systems to change. If the willingness and ability to change cannot be mustered, we believe the result will be lose-lose transformation, a scenario in which the situation for virtually all stakeholders in the healthcare system deteriorates.
Fortunately, there is a more positive scenario, but it is one that will require new levels of accountability, tough decisions, and collaborative hard work on the part of all stakeholders. Specifically, we strongly recommend:

**Healthcare providers** expand their current focus on episodic, acute care to encompass the enhanced management of chronic diseases and the life-long prediction and prevention of illness.

**Consumers** assume personal responsibility for their health and for maximizing the value they receive from a transformed healthcare system.

**Payers and health plans** help consumers remain healthy and get more value from the healthcare system and assist care delivery organizations and clinicians in delivering higher value healthcare.

**Suppliers** work collaboratively with care delivery organizations, clinicians, and patients to produce products that improve outcomes or provide equivalent outcomes at lower costs.

**Societies** make realistic, rational decisions regarding lifestyle expectations, acceptable behaviors, and how much healthcare will be a societal right versus a market service.

**Governments** address the unsustainability of the current system by providing the leadership and political will power needed to remove obstacles, encourage innovation, and guide their nations to sustainable solutions.

If stakeholders can act with accountability and demonstrate the willingness and ability to change, they can better harness the drivers of change and achieve a win-win transformation. These healthcare systems will become national assets rather than liabilities. They can help the citizens they serve lead healthier, more productive lives, and their countries and companies compete globally. They will also help these countries win a competitive advantage in the emerging global healthcare industry.

**Transforming into the era of action and accountability**

Action and accountability are the basic ingredients of change. To successfully transform their healthcare systems, we believe countries will undertake the following actions:

- **Focus on value** – Consumers, providers, and payers will agree upon the definition and measures of healthcare value and then, direct healthcare purchasing, the delivery of healthcare services, and reimbursement accordingly.

- **Develop better consumers** – Consumers will make sound lifestyle choices and become astute purchasers of healthcare services.

- **Create better options for promoting health and providing care** – Consumers, payers, and providers will seek out more convenient, effective, and efficient means, channels, and settings for health promotion and care delivery.

![Win-Win Transformation](source: IBM Institute for Business Value.)
A clear accountability framework empowers these actions. Accountability must span the system with governments providing adequate healthcare financing and rational policy, healthcare professionals adhering to clinical standards and delivering quality care, payers incentivizing preventive and proactive chronic care, and citizens taking responsibility for their own health.

The value transformation
Value is in the eye of the purchaser, but today value in healthcare is difficult to see. Data regarding the healthcare prices is tightly held and difficult, if not impossible, to access or comprehend; quality data is scarcer still and mostly anecdotal or incomprehensible. To complicate matters, the purchasers and benefactors of healthcare – consumers, payers, and society – all have different opinions as to what constitutes good value. Balancing and resolving these conflicting perspectives is one of the major challenges in the successful transformation of healthcare systems.

Today, consumers often have little direct responsibility for bearing the costs of healthcare and their ability to predict healthcare quality is equivalent to a roll of the dice. Payers – public or private health plans, employers, and governments – shoulder the burden of healthcare costs, but often incentivize poor quality care in pursuit of reduced episodic costs. Societies tend to pay little attention to healthcare costs or quality until service levels for healthcare or other societal ‘rights’ are threatened.

By 2015, in the win-win scenario we envision, consumers will assume much greater financial oversight and responsibility for their healthcare, which, in turn, will drive the demand for value data that is readily accessible, reliable, and understandable. Payers will take a more holistic view of value – looking not simply at the episodic costs of procedures but at how investments in high quality preventive care and proactive health status management can improve quality and help minimize the long-term cost structure of care. Societies will understand that healthcare funds are not limitless and will demand that payment for and quality of healthcare services be aligned to the value those services return both to the individual and to the country or region as a whole.

The consumer transformation
The second key element in the win-win transformation of healthcare systems is increased consumer responsibility for personal health management and maximizing the value received from the healthcare system. As countries are pressed ever closer to the wall of healthcare crisis, the pressure is building for consumers to change counterproductive health behaviors and actively participate in their healthcare decisions.

Approximately 80 percent of coronary heart disease, up to 90 percent of type 2 diabetes, and more than half of cancers could be prevented through lifestyle changes, such as proper diet and exercise.

Today, consumers will not or cannot define value in healthcare. Some do not care what healthcare costs because they see it as free or prepaid. Some do care, but find it prohibitively difficult to access meaningful information they need to make sound choices. And still others do not have the literacy skills required to navigate these choices. Compounding the problem is the fact that there is a relatively
widespread disregard for healthy lifestyle choices among consumers. The rising rates of obesity and chronic disease and the continuing scourge of HIV/AIDS are all direct indicators of unhealthy choices.

By 2015, in the win-win scenario, we believe consumers will comparison shop for healthcare in the same manner that they shop for other goods and services. Health infomediaries, who will help patients identify the information required to make sound choices, interpret medical information, choose between care alternatives and channels, and interact with the providers they choose, will become fixtures in the healthcare landscape for both the well and the chronically ill, and for a much broader socioeconomic segment of the population. And, lifestyle choices will be more explicit, with poor choices being accompanied by short-term consequences.

The care delivery transformation
The third key element in the win-win transformation of healthcare is a fundamental shift in the nature, mode, and means of care delivery. Healthcare delivery is overly focused on episodic acute care; it must shift and expand to include and embrace prevention and chronic condition management in order to respond to the emerging environment.

Today, preventive care, which focuses on keeping people well through disease prevention, early detection, and health promotion, is a concept without a champion. Generally speaking, consumers ignore it, payers do not incentivize it, and providers do not profit from it. By 2015, we expect that the notion of preventive healthcare itself will expand, combining Eastern and Western approaches and the best of the old and the new.

Consumers will seek this care in new settings, such as retail stores, their workplaces, and their homes, that offer lower prices, enhanced convenience, and more effective delivery channels than traditional healthcare venues. Preventive care will likely be delivered by midlevel providers – including physician assistants, nurse practitioners, nutritionists, genetic counselors, and exercise experts – in close coordination with doctors.

Today, as the incidence of chronic illness explodes, chronic care management remains expensive, labor intensive, and plagued by wide variations in the effectiveness of care. By 2015, we believe chronic patients will be empowered to take control of their diseases through IT-enabled disease management programs that improve outcomes and lower costs. Their treatment will center on their location, thanks to connected home monitoring devices, which will automatically evaluate data and when needed, generate alerts and action recommendations to patients and providers. Patients and their families, assisted by a health infomediaries, will replace doctors as the leaders in chronic care management, a shift that will eliminate a major contributor to its cost and because of doctor time constraints, its brevity.

Preventable medical errors kill the equivalent of more than a jumbo jet full of people every day in the US\textsuperscript{11} and about 25 people per day in Australia.\textsuperscript{12}

Today, acute care is the foundation of the healthcare economy and its effectiveness depends heavily on the expertise of the individual doctor. By 2015, we anticipate that standardized approaches to acute care, developed through the careful analysis of clinical
data and the unrelenting documentation of patient variation, will be a widespread starting point in care delivery. The availability of high quality care information will enable the treatment of non-urgent acute conditions, such as strep throat and sinusitis, at the patient’s home via the use of telemedicine or at retail settings that provide low cost, good quality, and convenience. This will free doctor time and encourage the transformation of today’s massive, general purpose hospitals into “centers of excellence” devoted to specific conditions and combination triage centers, which determine the specialized facility patients should go to, and post treatment recovery centers, in which patients are monitored before returning home.

**A prescription for accountability and win-win transformation**

The transformational challenge facing many healthcare systems globally is daunting. They must expand their primary focus on often poorly coordinated episodic care to encompass the life-long and coordinated management of preventive, acute, and proactive chronic care. This expansion must be achieved with limited incremental funding in an increasingly competitive global economy and healthcare environment. This task will further require the establishment of a clear, consistent accountability framework supported by aligned incentives and reconciled value perspectives across key stakeholders. But, the rewards of successful transformation are correspondingly high.

Successful transformation will require all stakeholders to actively participate, collaborate, and change. The following table summarizes recommendations by stakeholder to collectively transform to a value-based healthcare system with new models of delivering care to accountable consumers.

*Healthcare 2015* paints a portrait of what the global healthcare industry could look like a decade from now. Parts of the portrait already exist in some countries. Even so, bringing the entire portrait to life is an extraordinarily difficult, but vitally important task, which must be informed and achieved through a process of debate and consensus, and action and accountability. We hope that our ideas will serve as a starting point in your transformation effort.
Summary of Healthcare 2015 recommendations by stakeholder.

<table>
<thead>
<tr>
<th>Transforming value</th>
<th>Transforming consumer accountability</th>
<th>Transforming care delivery</th>
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</thead>
<tbody>
<tr>
<td><strong>Healthcare systems</strong></td>
<td>• Develop a vision, principles, and metrics that enable and reward a shared perspective on value</td>
<td>• Provide universal insurance for core services, including preventive and primary care • Expect and reward good behaviors</td>
</tr>
<tr>
<td><strong>Care delivery organizations (CDOs)</strong></td>
<td>• Appropriately focus instead of being “all things to all people” • Develop teams of caregivers to deliver patient-centric, coordinated care • Implement interoperable electronic health records (EHRs) to help enable high-value services</td>
<td>• Help inform and empower consumers by providing transparency into pricing and quality</td>
</tr>
<tr>
<td><strong>Doctors and other clinicians</strong></td>
<td>• Help develop and appropriately utilize evidence-based, standardized processes and care plans • Help develop meaningful outcomes data</td>
<td>• Develop collaborative partnerships with patients • Help consumers take more responsibility for their health • Expect and monitor compliance</td>
</tr>
<tr>
<td><strong>Consumers</strong></td>
<td>• Expect CDOs and clinicians to provide pricing and quality information • Learn about the healthcare system and become a smart shopper • Utilize health informediaries</td>
<td></td>
</tr>
<tr>
<td><strong>Health plans</strong></td>
<td>• Work collaboratively with CDOs and clinicians to develop a viable transition plan to value-based reimbursement • Help consumers navigate the health system to get more value</td>
<td>• Help provide personalized information and advice to help consumers maintain and improve their health status</td>
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<tr>
<td><strong>Suppliers</strong></td>
<td>• Develop offerings that help provide better longer-term outcomes or lower prices for equivalent outcomes</td>
<td>• Help identify the right patients and providers and then educate them to achieve better results across all steps of the care process</td>
</tr>
<tr>
<td><strong>Societies</strong></td>
<td>• Clearly recognize the need for tough decisions, prioritization, and tradeoffs and the need to reconcile perspectives on value • Actively participate in efforts to improve healthcare</td>
<td>• Stress prevention and personal accountability • Expect and promote healthy lifestyles</td>
</tr>
<tr>
<td><strong>Governments</strong></td>
<td>• Emphasize value, accountability, and alignment of incentives in health policy, regulations, and legislation • Require results reporting • Develop a funding strategy for the healthcare infrastructure and for independent research on the comparative effectiveness of alternative therapies</td>
<td>• Help protect security/privacy of electronic health information • Require insurance coverage for everyone, with subsidies for those who need them</td>
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</table>
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About IBM Global Business Services

With consultants and professional staff in more than 160 countries globally, IBM Global Business Services provides clients with business process and industry expertise, a deep understanding of technology solutions that address specific industry issues, and the ability to design, build, and run those solutions in a way that delivers bottom-line business growth.
References


Providing business and clinical innovations to dramatically improve healthcare
Progressing towards healthcare transformation
THE ENVIRONMENT

Today’s healthcare organizations face unprecedented demands. They must outperform competitors, deliver patient satisfaction, address patient safety initiatives, reduce clinical and administrative costs, meet compliance and security mandates, harness an explosion of data and transform it into useable information, streamline distribution processes, accelerate drug discovery and create targeted treatments. It is critical that organizations thoroughly understand the scope of each of these challenges in order to implement the most productive – and successful - solutions.

THE STRATEGY

Change is complex. A single adjustment in one department can affect many others — extending out to health plans, patients and employers. Creating balance among these constituents is critical to success. In isolation, this could be a daunting task. But with an experienced team of professionals trained in healthcare processes, applications and infrastructure, organizations can greatly reduce exposures while improving their success rate.

IBM, with its network of Business Partners, provides solutions in clinical and business process optimization, patient centric networks and health and wellness management. Designed to help deliver safer, more affordable and effective diagnostics, drugs and medical care, these innovative solutions and services facilitate collaboration, interoperability, patient safety and efficiency — in a responsive, scalable and secure environment.

Since the acquisition of Healthlink Incorporated, one of the nation’s foremost healthcare process improvement and IT consulting companies — the IBM healthcare solutions portfolio has been enhanced and expanded to include:

- Clinical and financial system implementations
- Patient data management
- Clinical data optimization
- Financial and operational management
- Compliance

In addition, more than 300 Healthlink consultants have joined IBM to collaboratively serve healthcare organizations. Together with its Business Partners, IBM can provide the guidance and solutions necessary to help optimize patient care and drive breakthrough operational efficiency.
IBM provides solutions that can help enable health plans to reduce the time and costs associated with customer operations, enhance care with disease management and wellness programs and develop innovative, customer-focused products. By using solutions that link constituents, health plans can enhance communication, collaboration and convenience for all, while gaining significant operational efficiencies and improving member retention and growth.
HOME
Today’s physicians are on call from home, on the road and everywhere else. They need secure, immediate access to patient information to quickly respond to patient needs. IBM solutions help enable secure, reliable access to patient information at anytime. This not only provides remote access but can also help physicians make the most of a precious resource: time.

CLINIC
As nearly 70 percent of patient care is delivered in doctors’ offices — not hospitals — it is critical that today’s practitioners have the ability to share patient information securely between private offices, clinics and hospitals as well as with state and local governments. IBM health-care solutions help to establish secure environments for data access and distribution, to streamline operational efficiencies and to improve patient safety and satisfaction.
Get the power of the IBM Fair Market Value leasing program to acquire medical technology. IBM services healthcare organizations with custom packages designed for each client's unique financing and leasing requirements. IBM can also help monetize older imaging assets – helping to turn older or under-utilized imaging assets into cash.

For more information on IBM solutions for healthcare, visit ibm.com/healthcare.
1 BUSINESS INTELLIGENCE

Understand and act on information in clinical practice, healthcare management and administration and medical research to improve the quality of patient care, improve patient safety and curb costs. IBM can help healthcare organizations transform existing data into actionable information across the enterprise — sparking insight and supporting timely, thoughtful business decisions.

2 MOBILITY SOLUTIONS

Transform clinical environments to provide immediate, secure access to patient information at the point of patient care. IBM can provide the enabling technology — including infrastructure, wireless communication devices, RFID technology and integration middleware — needed to support existing and emerging clinical processes. No matter where organizations are in the implementation process, IBM consultants can help develop and deploy departmental solutions or comprehensive, end-to-end solutions that extend throughout the hospital and beyond.

3 REGULATORY COMPLIANCE

Anticipate and adhere to regulatory compliance by JCAHO, HIPAA and other mandates in healthcare. IBM helps to translate regulatory requirements, identify related business and IT strategy challenges and define and implement responsive action plans.

4 ON DEMAND INFRASTRUCTURE

Improve patient safety by securely integrating patient data across the enterprise and beyond (local regional health information organizations, clinics, etc.) and transforming it into usable information. Control costs by deploying a variable IT infrastructure. IBM can help healthcare enterprises evolve and use existing IT infrastructure, enabling them to respond quickly, work efficiently, seize new opportunities and remain resilient.

5 SECURITY AND PRIVACY

Protect patient data from internal and external threats. Help ensure 24X7 availability and secure, immediate accessibility to critical patient data. Eliminate the need for multiple sign-ons and user passwords but ensure immediate access to data by authorized users. IBM has a broad array of security and privacy point technology enablers and solutions to help address informational and physical security and privacy needs, as well as regulatory compliance.

6 MEDICAL IMAGING

Facilitate digital image storage, access and workflow, and enable remote diagnosis and consultation across the hospital and beyond. Enhanced integration of digital imaging with both internal and external clinical data helps IBM provide comprehensive, secure, and cost-effective imaging and storage solutions.

7 BUSINESS CONTINUITY AND DISASTER RECOVERY

Maintain seamless and secure access to patient information during scheduled and unscheduled downtimes. Business Continuity and Disaster Recovery solutions from IBM enable healthcare organizations to remain operational and responsive amidst planned and unplanned service disruptions. In the event of a service failure, priority-based recovery strategies reduce risk, mitigate downtime and preserve a secure IT environment by keeping the most critical applications safe.

8 ELECTRONIC MEDICAL RECORD (EMR)

Transform silos of patient data and multiple service records into a single, concise, user-friendly view of patient information at the point of patient care. IBM helps to minimize confusion surrounding EMR with solutions that integrate patient information securely across an enterprise - both between internal divisions and external organizations.

9 IT TRANSFORMATION

Focus time and resources on providing flexible, scalable systems within an IT operating environment that supports immediate and secure 24X7 access to critical patient information. Using proven methodologies and service-oriented architecture (SOA), IBM works with healthcare organizations to develop tailored IT strategies, to identify preferred delivery methods (on-site, off-site, near-site, outsourced, etc.) and to implement solutions.

10 CLINICAL GENOMICS

Utilize data in search of scientific discovery and new treatments for disease. IBM and its Business Partners can assist by providing the domain expertise, technology and services that researchers and professionals in biotechnology, pharmaceuticals, academic and government laboratories and medical research centers need.

11 CLINICAL AND BUSINESS OPTIMIZATION

Align your clinical system with your needs and processes. Optimize its functionality. IBM Healthlink Solutions help healthcare organizations advance existing clinical systems through improvements in business processes and information technology. By helping healthcare organizations select and implement solutions that integrate clinical information with back-office and administration systems, productive use of information increases across the enterprise. IBM's advisory services, designed to smooth operational issues such as interim management, IT assessment and physician integration, also help organizations understand how today’s technology choices may impact their vision for the future.

12 PORTALS

Provide secure, roles-based single point of access to patient information, applications, tools and services to increase staff productivity, efficiency and improve operational effectiveness. IBM and its Business Partners work with the existing IT infrastructure to develop a solution tailored to each healthcare organization's needs.
Swedish Medical Center embraces the leading edge with a first-class data center built with help from IBM.

Swedish Medical Center (www.swedish.org) is one such healthcare provider. Founded in 1910 with just $10,000, a renovated apartment building and 24 beds, Swedish Medical Center is now one of the largest, most comprehensive nonprofit healthcare providers in the Pacific Northwest region. Based in Seattle, Washington, it has four campuses—First Hill, Providence, Ballard and Issaquah—that include multiple specialty clinics, a new community-based emergency room, a network of 12 primary-care clinics, a home-care services program, and affiliations with suburban hospitals and physician groups. In addition, Swedish Medical Center is a regional referral center and provides specialized treatment in cardiac care, oncology, orthopedics, high-risk obstetrics, neurological care, sleep medicine, pediatrics, and organ transplantation. The hospital also conducts clinical research.

Providing exemplary healthcare—96 years and counting
Superior healthcare goes beyond just treating the physical. It combines innovative treatment and expertise with kindness and sensitivity. It blends state-of-the-art facilities and services with genuine compassion and concern. And it provides a healing environment for those who need it—throughout the community or from around the world.

**Challenge**
Design and construct a data center that would better support medical center needs

**Solution**
A resilient, scalable and reliable data center

**Key Benefits**
- Established a central, reliable source for IT operations and control
- Eliminated single points of failure

“I would never have wanted to attempt this type of project without IBM and their leadership.”

— Janice Newell, CIO, Swedish Medical Center

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**Overview**

- **Challenge**
  Design and construct a data center that would better support medical center needs

- **Solution**
  A resilient, scalable and reliable data center

- **Key Benefits**
  - Established a central, reliable source for IT operations and control
  - Eliminated single points of failure
“We have distinguished ourselves by delivering extremely high-quality healthcare. Our doctors have earned great reputations,” says Janice Newell, CIO for Swedish Medical Center.

For Swedish Medical Center, the leading edge is a critical place to be—not for the prestige, but to continue offering the most innovative healthcare available. To keep its positive momentum going, Swedish Medical Center had launched a US$120 million clinical information system. As part of the initiative, the healthcare provider was transitioning from paper-based medical records to electronic records to improve the quality of care and help minimize errors as well as help improve day-to-day operational support for medical staff members.

Performing surgery on an outdated IT environment

But as Swedish Medical Center embraced its new initiatives, its senior managers quickly realized that the current IT environment could no longer keep up with the evolving technological requirements.

“We had to get ourselves to a data center that was capable of supporting our delivery of care with technology,” says Newell. “Our data center was wholly inadequate.”

The hospital’s IT operations and data center had reached maximum capacity. The data center also needed to upgrade its power capabilities to support new applications, which in turn would increase its cooling requirements. In addition, the overall physical IT environment for housing support personnel was constrained.

Not only was Swedish Medical Center’s data center insufficient, but it also needed to be relocated to make way for the expansion of several other buildings on campus. The new data center had to be designed, constructed and brought online in less than 12 months—and schedule slippage was not an option.

Building a robust data center from the ground up

Swedish Medical Center turned to the IBM Global Services team to determine how to achieve the hospital’s overall technical goals and begin the process of building a world-class data center. Initially, IBM helped Swedish Medical Center establish a statement of requirements and provided a schematic design to outline the data center’s specific design points. IBM then evaluated the levels of data redundancy that were needed to avoid any single points of failure.
Swedish Medical Center and IBM also collaborated on facility size requirements to help ensure that the new data center was designed to be flexible and scalable enough to accommodate future opportunities and growth. IBM was then able to complete the design and construction of the new data center. As the general contractor for the build out, IBM assumed complete responsibility for all aspects of the construction project and specified, procured and installed all the necessary equipment to support all data center functions and operations.

After the IBM team completed construction, it tested and commissioned the facility to ensure that it was functioning properly. IBM also managed the relocation of approximately 500 servers and numerous computers and storage devices to the new facility. The relocation was accomplished with detailed planning and scheduling. Each specific application and its associated server/storage were mapped to successfully bring the application back online. The relocation was choreographed in weekend move waves to help reduce any effect on Swedish Medical Center operations.

The result was a data center that could meet Swedish Medical Center’s current and future requirements—and one that was constructed within the hospital’s aggressive timeline.

“IBM’s strict project management processes and dedication—such as the running of crews almost 24x7—helped keep the project on its critical timeline,” says Steve Horsley, director of IT infrastructure for Swedish Medical Center.

“I can truly say IBM led to our success.”
—Steve Horsley, director of IT infrastructure, Swedish Medical Center

Today, Swedish Medical Center has a data center it truly can rely on. Designed to minimize the chances of downtime, the new data center incorporates dual power sources all the way back to the main building power plant. Each server cabinet includes dual power distribution units fed by separate remote power panels, which are in turn fed by dual power distribution units supported by dual uninterruptible power supply (UPS) modules with separate battery systems. The electrical system is then backed up by a redundant building generator plant. The cooling system is also redundant and features a chilled water solution supported by water source feeds from two sides of the data center and redundant air-conditioning units.

In addition, IBM provided and installed a dual-path cabling system throughout the facility. The system, which incorporates dual-fiber runs to every cabinet and copper runs where needed, is coupled with Swedish Medical Center’s redundant network core to help create a highly available communications network.

At 6,000 square feet, the new data center is nearly twice the size of the old data center. It incorporates seismic supports and a number of security features, including a dry pipe preaction sprinkler system and an FM200 fire suppression system. The facility also includes a new state-of-the-art network operations center (NOC) that IBM designed and built. The NOC features custom ergonomic furniture and a 10.8’ x 9’ sectional screen for monitoring IT operations.

To allow for future growth, the main infrastructure was sized to accommodate the installation of additional UPS and cooling systems as needed. And because Swedish Medical Center’s management team requested that IBM ensure that upgrades and maintenance would not affect ongoing IT operations, the hospital should experience no outages when it expands its systems.

“It’s just night and day from where we were,” Newell says.
Collaborating with IBM—facing a healthier future

With the new data center in place, Swedish Medical Center can now move forward on other key business objectives. The completion of the NOC and the IT improvements will enhance the quality and speed of medical services as well as provide noticeable financial savings. Plus, the inclusion of environmental status alerts on power and cooling along with enhanced security monitoring will help Swedish Medical Center monitor its IT operations more closely around the clock, every day. The new data center allows Swedish Medical Center to:

- **Focus on core competencies**
- **Sustain high levels of redundancy and increased capacity using dual-fed connectivity**
- **Provide future growth capacity for the new operations**
- **Accommodate existing and future UPS systems and air-conditioning requirements.**

“I would never have wanted to attempt this type of project without IBM and their leadership,” says Newell.

Horsley agrees. “I can truly say IBM led to our success.”

**For more information**

To learn more about IBM’s data center solutions, contact your IBM representative or visit:

[ibm.com/services/datacenter](http://ibm.com/services/datacenter)