



GREATER CHICAGO *Chapter*

# Considerations For Future Technology Planning In Coordination With New Facility Design

Gerard M. Nussbaum  
Director, Technology  
Services

Kurt Salmon Associates

Presented 17 January 2008

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**Gerard M. Nussbaum**  
**Director, Technology Services**

**Career  
Summary**

Gerard has over 20 years of health care and industry experience dealing with information technology, finance, and marketing functions. He has assisted clients with a wide range of information systems, telecommunication, and networking planning, vendor selection, and implementation project management assignments; interim management; merger and consolidation; electronic health record system planning; facilities planning and design, and development of systems to model mergers and acquisitions.

Gerard also has held leadership roles at a major hospital alliance and a major healthcare manufacturer/supplier.

**Areas of  
Expertise**

- Technology visioning for new facilities planning; infrastructure budgets and requirements as part of overall facilities design and planning
- Electronic Health Record planning and deployment and community/physician health record initiatives
- Voice and data infrastructure assessment, network and telecommunications design review, and network tactical and strategic plan development, selection and implementation
- Evaluation, selection, contract negotiation, acquisition of software, hardware, and enterprise voice and data network systems (wired and wireless) infrastructure.
- Project management of application, network, and technology implementations
- HIPAA and security assessment and remediation
- PACS strategy development, system selection, and contract negotiations
- Senior information technology interim management
- Relocation of Data Center and information technology infrastructure
- Call Center strategy, development, selection, and implementation
- E-health strategy, development, and implementation
- Central Business Office, Physician Practice, and Management Services Organization creation and start up
- Design and implementation of technical and end-user training and Help Desk system selection and design
- Outsourcing and ASP analysis, negotiation, and management
- Service Level Agreement development
- Regional and Community Health Information Network planning and cost benefit assessment

**Selected  
Clients**

Catholic Health Care Network, New York, NY	Massachusetts General Hospital, Boston, MA
Cedars Sinai, West Hollywood, CA	Mount Sinai/NYU Health System, New York, NY
Children's Memorial Hospital, Chicago	ProHealth Care Inc., Waukesha, WI
City of Hope, Duarte, CA	Saint Barnabas Health Care System, Livingston, NJ
Columbia St. Mary's, Milwaukee, WI	Saint Raphael Healthcare System, New Haven, CT
Elmhurst Memorial Healthcare, Elmhurst, IL	Santa Clara Valley Health and Hospital System, San Jose, CA
Johns Hopkins, Baltimore, MD	Strong Health System/University of Rochester Medical Center, Rochester, NY
JPS Health Network, Fort Worth, TX	Trinity Health, Novi, MI
Kaleida Health, Buffalo, NY	University of California, Los Angeles, CA
Lifespan Health Corporation, Providence, RI	University of California, San Francisco, CA
Los Angeles County Department of Health Services, Los Angeles, CA	
Louisiana State University Health Care Services, New Orleans, LA	

**Speaker/  
Author**

Healthcare Information and Management Systems Society (HIMSS)  
Healthcare Financial Management Association (HFMA)  
College of Healthcare Information Management Executives (CHIME)

**Education**

Juris Doctorate, Chicago Kent College of Law  
BS and an MS in Accountancy from the University of Illinois, Urbana-Champaign  
CPA, CMA and a Registered Communications Distribution Designer (RCDD)

# INFORMATION TECHNOLOGY SERVICES

## HEALTH SERVICES DIVISION

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## FIRM

Kurt Salmon Associates (KSA) Health Services Division is the premier management consulting firm advising today's leading health care organizations in strategy, facilities planning, and information technology. We work closely with our clients to raise the critical questions, explore the full range of vision and possible innovation, and develop recommendations that can be implemented.

## MISSION

Our mission is to improve each client's overall performance consistent with its mission, values, objectives, and market realities.

## CLIENTS

Our national client base of 1,200 organizations includes leading integrated health care organizations, academic medical centers, specialty and community hospitals, children's hospitals, physician practices, and non-acute care organizations. Our clients include all of the *U.S. News & World Report* Honor Roll. Our high percentage of additional engagements from existing clients is clear evidence of the demonstrated value these clients attribute to our services.

## EXPERTISE

KSA offers real-world experience in strategic and program planning, operations, executive leadership, information technology, facility master planning, functional and space programming, process design, project management, and finance. Professionals are incorporated into project teams designed to meet each client's specific needs.

## DISTINCT ADVANTAGE

KSA prides itself on its reputation of thought leadership and quality results. Our high proportion of principals to staff consultants provides clients with the benefits of in-depth experience, perspective, and judgment. We have no vendor relationships, offer no products, and have no real or perceived conflicts of interest.

## SERVICES

We help our clients succeed today and plan for the future by developing and integrating three distinct competencies that define the high-performing organization: strategy development and implementation, facilities planning, and information technology.

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## **STRATEGIC AND TACTICAL PLANNING**

KSA's participatory methodology examines all aspects of our clients' technology deployment and compares it with industry best practices. The result is a comprehensive "roadmap" aligned with corporate strategies. It includes resource requirements, budgets, and implementation plans, incorporating discrete initiatives that are comprehensive, justifiable, and actionable.

## **SYSTEM SELECTION AND CONTRACT NEGOTIATION**

KSA applies years of experience working with multidisciplinary client teams to select the most appropriate systems and technology. We work with our clients to structure sound business arrangements, negotiate favorable contracts, and mitigate client risks.

## **READINESS ASSESSMENT**

KSA evaluates the current information technology environment, organizational readiness for advanced functionality and emerging technologies, integration requirements, resource availability, workflow, the vendor marketplace, and best practices to devise an optimal strategy for deploying next-generation systems and processes.

## **BUSINESS INTELLIGENCE**

KSA understands the unique organizational challenges of transforming disparate corporate data assets into a managed business intelligence resource. Clients pursuing performance management, data warehousing, and decision support strategies work closely with KSA to assess, design, select, and implement appropriate technologies, methodologies, and processes.

## **OUTSOURCING EVALUATION**

KSA assists in evaluating the feasibility of outsourcing, crafting an outsourcing strategy, identifying alternative solutions, assessing the impact on operations, performing due diligence, negotiating contracts, and devising exit strategies.

## **INFRASTRUCTURE**

KSA assists with the strategic planning, design, and implementation of secure and robust wired and wireless networks, data centers, telecommunications, tracking technology, and host environments to support organizational goals, security, data convergence, and major application efforts. KSA also assists clients with business/risk impact analysis, disaster recovery strategy, planning, and service selection based on industry best practices.

## **INTERIM LEADERSHIP AND PROJECT MANAGEMENT**

KSA supports clients in need of interim senior leadership and project management. Our professionals, who have previously served as directors, CIOs, and senior project managers for leading health care organizations, provide project management office support for significant technology implementations and

transition planning. KSA anticipates conversion, integration, process redesign, and operational challenges; maintains schedules and budgets; and minimizes negative impact to implementation and transition projects.

## **TECHNOLOGY PLANNING FOR NEW FACILITIES**

KSA supports clients as they consider the technology-enabled vision and workflow for new and renovated facilities. We identify the associated technology requirements, impact on design, and budgetary support required. We incorporate the latest proven technology innovations into each design to ensure technology and building synergy, and maximize future flexibility.

## **OPERATIONAL PROCESS AND WORKFLOW REDESIGN**

KSA analyzes the patient experience, access, care, and support processes. We work with clients to develop new best-practice operating models and recommendations for redesign, including identification of required information technology capabilities to improve the patient experience, clinician and staff satisfaction, and process efficiency and effectiveness.

## **PROCESS IMPROVEMENT**

KSA conducts an objective assessment of clients' core information technology support and delivery processes, including project management, help desk and desktop support, change management, and incident management. Our recommendations help clients focus efforts and improve service levels for their information technology department using industry best practices (e.g., ITIL).

## **CONNECTING COMMUNITIES PLANNING**

KSA assists emerging and established RHIOs, as well as health systems desiring to connect with their affiliated physicians, with planning and governance issues, business plan and funding model development, project feasibility and design, data exchange standardization, privacy/security issues, regulatory and legal implications (e.g., Stark/AKS) requirements, information exchange, and electronic medical record (EMR) and practice management technology selection.

## **CONSUMER HEALTH AUTOMATION PLANNING**

KSA assists clients with technology outreach and establishing new ways to transact with patients and consumers by planning for patient portals, walk-up kiosks, and related technologies.

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*For more information about KSA's Health Services Division, please visit [www.kurtsalmon.com](http://www.kurtsalmon.com) or call Elaine Remmlinger, Vice President and National Service Director, at 212.508.8374.*

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# Considerations For Future Technology Planning In Coordination With New Facility Design

## Topics

- The Need for New Facilities
- Technology Begets More Technology
- Change Drivers
- Information Is The Lodestar of The Future Healthcare Enterprise
- The Challenge of Planning For Future Technology
- Time is Paramount
- You Can Never Be . . .

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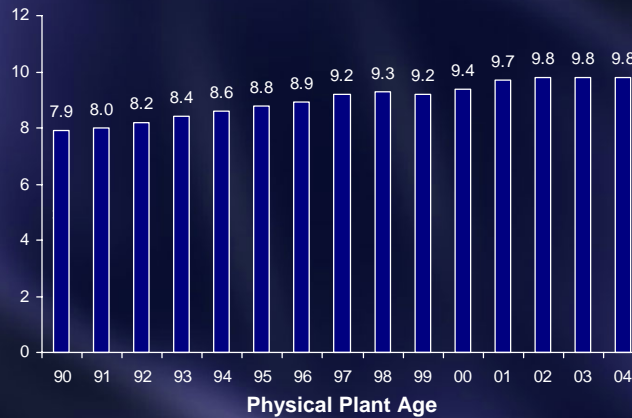
## The Need For New Facilities

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# Considerations For Future Technology Planning In Coordination With New Facility Design

## The Need for New Facilities

Despite a building boom, health care facilities are continuing to age. This is leading many health systems to plan replacement hospitals.



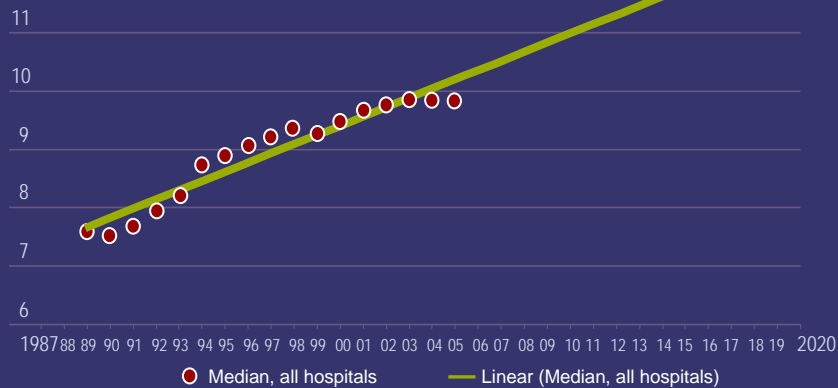
Source: CHIPS: The 1994 Almanac of Hospital and Financial Operating Indicators, The 1996-7 Almanac of Hospital and Operating Indicators, and 1998-2004 data from Ingenix: Almanac of Hospital Financial and Operating Indicators, 2006

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## Average Age of Plant (Accumulated Depreciation/Depreciation Expense)

"We believe that there is a correlation between quality of care and Average Age of Plant. Further increases may erode the quality advantage that our nation has enjoyed.

We project that Average Age of Plant will continue to increase for the next five years. We believe this trend is cause for concern and should be watched closely." CHIPS, 2007

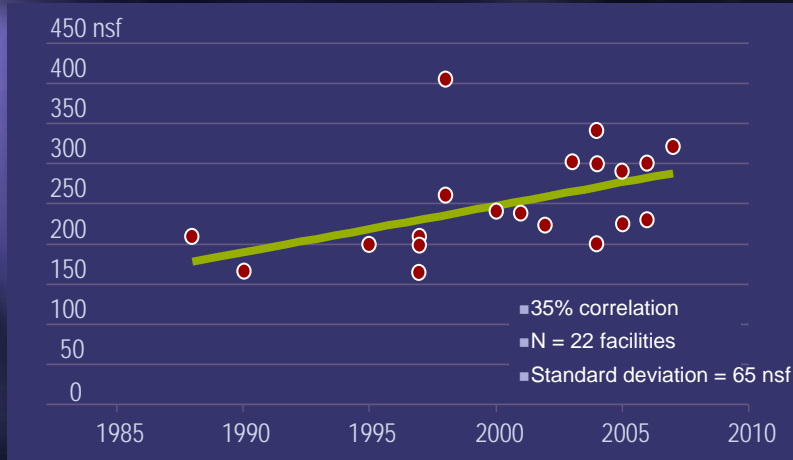


○ Median, all hospitals      — Linear (Median, all hospitals)

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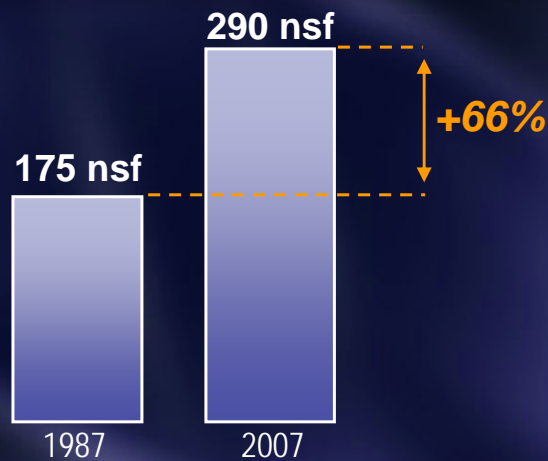
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## The Need for New Facilities: Acute Care Patient Room Grows



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## The Need for New Facilities: Acute Care Patient Room Grows



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## The Need for New Facilities: Acute Care Patient Room Grows

	2007 AVERAGE	20-YR INCREASE
Patient Rooms	320 nsf	66%
• Total Inpatient	825 dgsf	100%
Operating Rooms	625 nsf	39%
• Total Dx & Tx	800 dgsf	100%+
Total Facility	4,000+ bgsf	50%

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## The Need for New Facilities

Many institutions are embarking on the development of a replacement hospital.

- The deficiencies of the existing facilities are a key driver of the replacement effort:
  - Inadequate space,
  - **Poor fit with demands of today's technology-intensive clinical environment,**
  - **Costly to retrofit,**
  - Force inefficient workflow,
  - **Barriers to upgrading network infrastructure,**
  - **Unsuitable for wireless implementation,**
  - Location, and
  - Bifurcation of demand into ambulatory and serious acute
- ... Causing the gap between use of advance clinical technology and facility capabilities to grow wider by the day.

# Considerations For Future Technology Planning In Coordination With New Facility Design

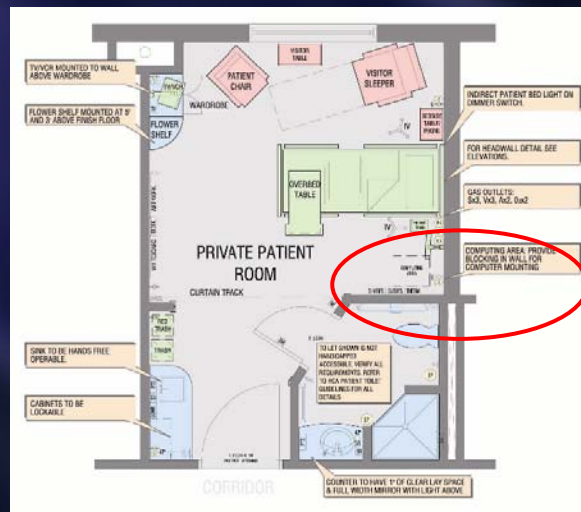
## Fundamental Forces



## Technology Futures – Patient Rooms

Many entities are looking to include fixed computer stations within each patient room for access and infection control purposes.

Medical-Surgical Room



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# Considerations For Future Technology Planning In Coordination With New Facility Design

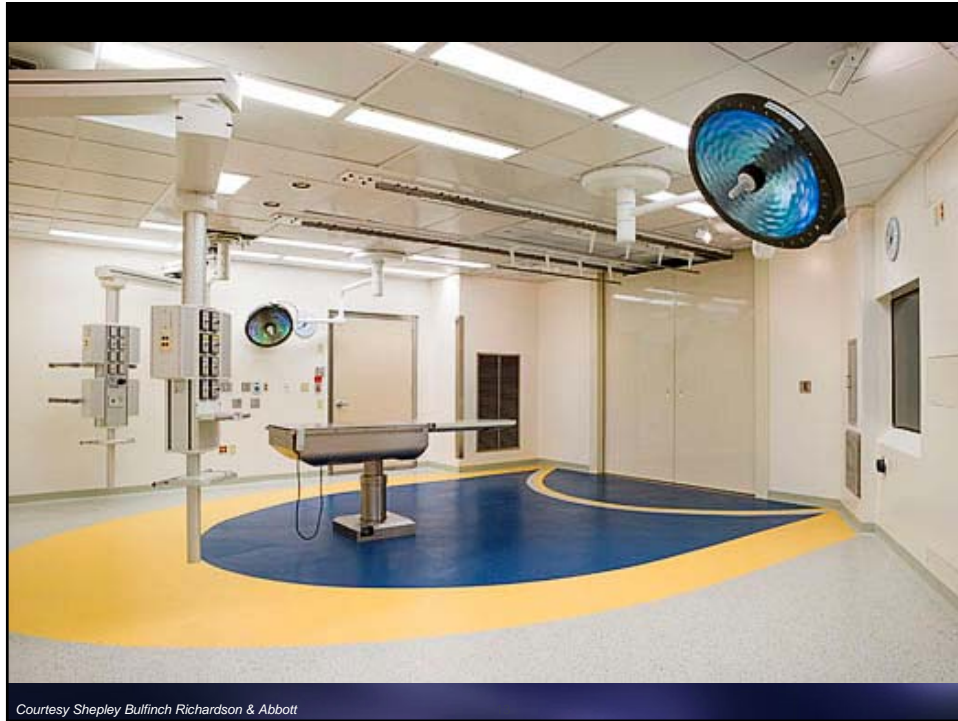
## Fundamental Forces



Technology Begets More  
Technology

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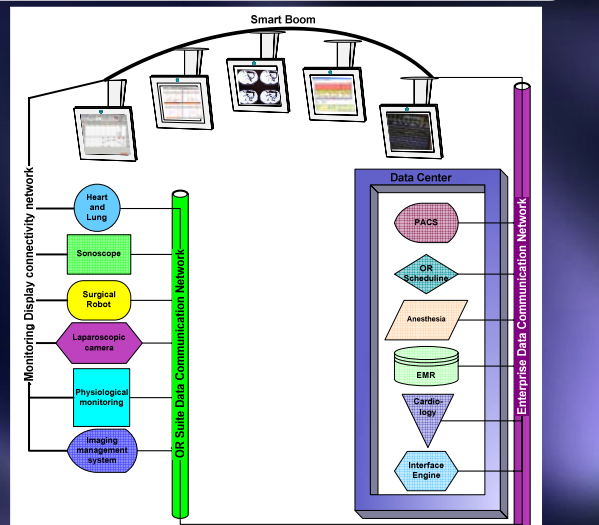
# Considerations For Future Technology Planning In Coordination With New Facility Design



## Perioperative Suite Of The Future

The Perioperative Suite of the Future will be a Digital Operating Room.

- Convergence of interventional & surgical procedures
- Technical integration of applications & medical equipment
- Integration of information systems
- Ergonomic placement



# Considerations For Future Technology Planning In Coordination With New Facility Design

## Surgical Issues & Trends

- Planning & programming OR suites – a few tips:
  - One OR design might not fit all . . .
    - Levels and type of technology will drive re-design of the OR.
  - We may be missing the point about OR size.
    - Migration of equipment and “things” to the interior of the OR should be challenged. More could be accommodated outside.
  - **Infrastructure design will contribute more to flexibility and adaptability than functional design.**
    - **Functionality will move from hardware to software.**
    - **Must ensure that utility and mechanical capacities anticipate future loads.**
  - **Anticipate the fully digital OR with integrated imaging.**

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## IT Implications Of The Digital OR

The Digital OR is a continually advancing paradigm, not a static end-point. The design must support and promote continual advances.

- **Infrastructure.** Full-fault-tolerance and high-availability
- **Physical structure.** Reinforced to support wide variety of ceiling technology
- **Networking.** Self-organizing wireless networks and above ceiling/below floor wiring
- **Plug & Play.** Rapid, cost-effective implementation/integration of best of breed technology
- **Integration.** Full integration of information systems, biomedical/physiological equipment
- **Unified Display.** Smart boom technology, flexible display of medical device screens and individually tailored applications system results
- **Staffing.** IT staff require additional training and experience
- **Funding.** More costly upfront; shorter replacement/upgrade cycles.
- **Robotics.** Full integration, computer-mediated remote surgical interventions.
- **Security.** Hardening, isolation, and real-time monitoring
- **Monitoring.** Real-time, 24-by-7 monitoring
- **Location.** OR level care distributed more widely throughout institution

# Considerations For Future Technology Planning In Coordination With New Facility Design

## Robotics

Newer technologies, such as robot surgery provide large potential benefits, but can substantially increase infrastructure requirements.



- Unaccommodating places are what robot-assisted surgery is all about. The human surgeon is not optimized for tiny spaces. Because pediatric surgeons must frequently work in small spaces, they have applied minimally invasive techniques to a broader range of procedures . . . than have other surgical specialists. With the advent of robotics, pediatric surgeons began to dream about fixing fetal problems in utero: a robot's computer can scale down a surgeon's hand movements into micromotions inside the fetal patient. And because no hysterotomy is required, such surgery is not subject to the disastrous complication of preterm labor.



Source: N. T. Berlinger, Robotic Surgery — Squeezing into Tight Places, 354 N Engl J Med 2006 (18 May 2006).

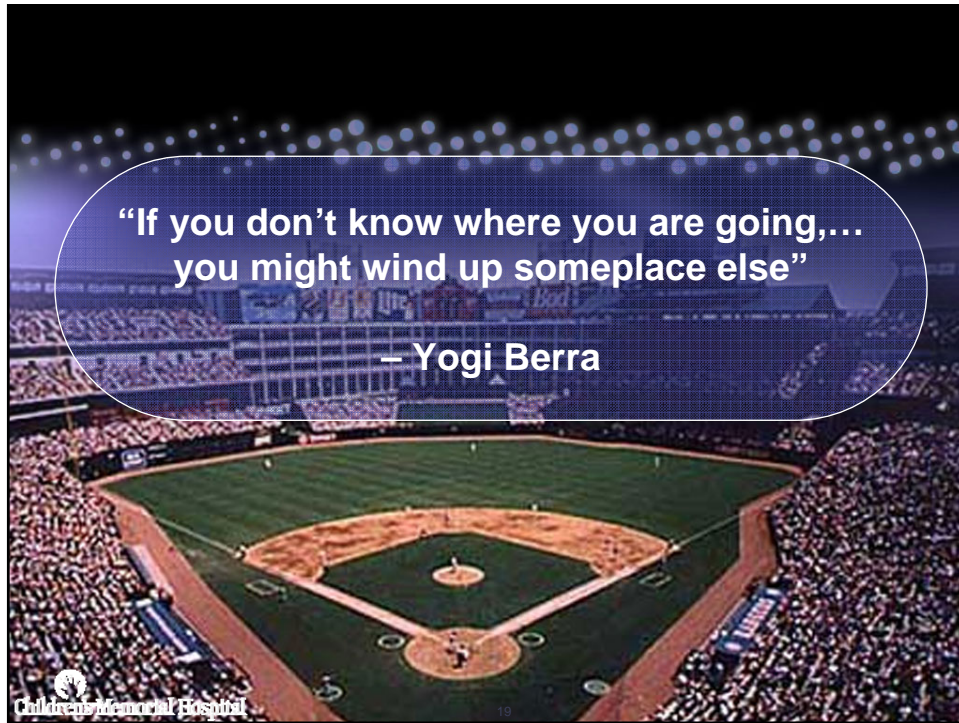
Photograph by B.D. Cohen/AD/O

## Change Drivers

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## Change Drivers: Fundamental Forces

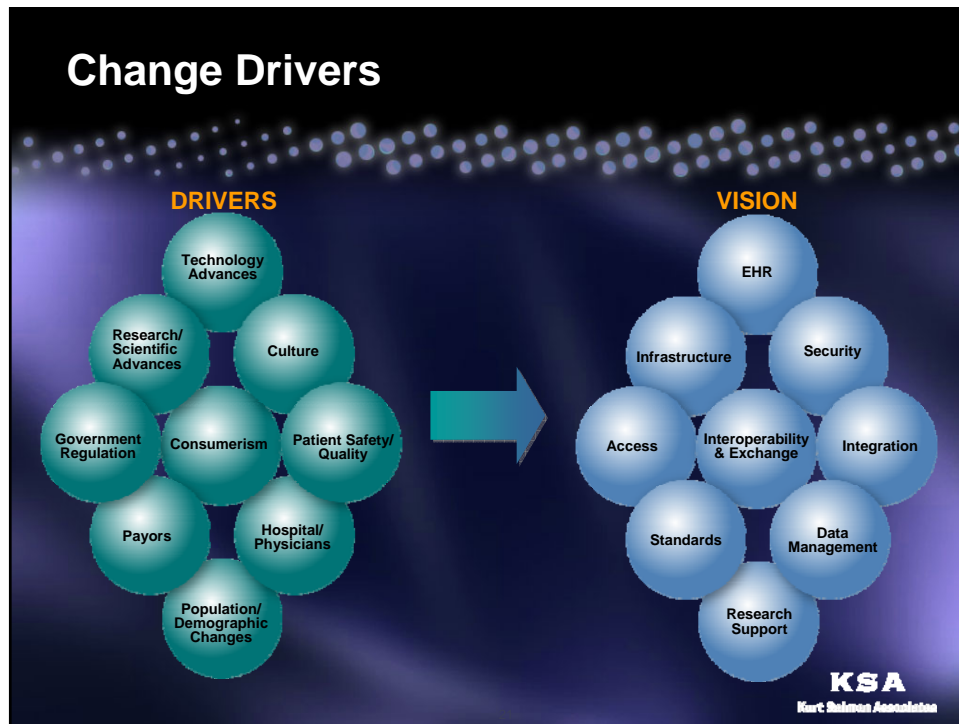
**PATIENT CARE** Amenities · Convenience · Healing · Environment · Integrative Medicine · Evidence-Based Design · Privacy · Safety

**INFORMATION** Pervasive Computing · Electronic Medical Record · Telemedicine Real-Time Feeds from Bio-Medical Equipment · Point-of-Care Testing · Automated Pharmacy and Supply · “Intelligent” Buildings

**TECHNOLOGY** Robotics · Miniaturization · Energy-Based Surgery · Surge in Imaging · Shift to Short-Stay Procedures · Blending/Blurring of Boundaries

**SAFETY AND SECURITY** Infection control · Terrorism · Secured Parking and Entrancing

# Considerations For Future Technology Planning In Coordination With New Facility Design



## Change Drivers: Planning Considerations

Technology planning for new facilities requires active involvement in and consideration of a plethora of issues.

- Technology infrastructure as important as the physical structure
- Demands on the technology infrastructure often are underestimated by factors of 50-to-100 percent
- Plan for the technology-rich clinical environment over the life of the building
- The technology infrastructure is as fundamental as the structural support of the building.
- Create infrastructures that are flexible, scalable and adaptable.

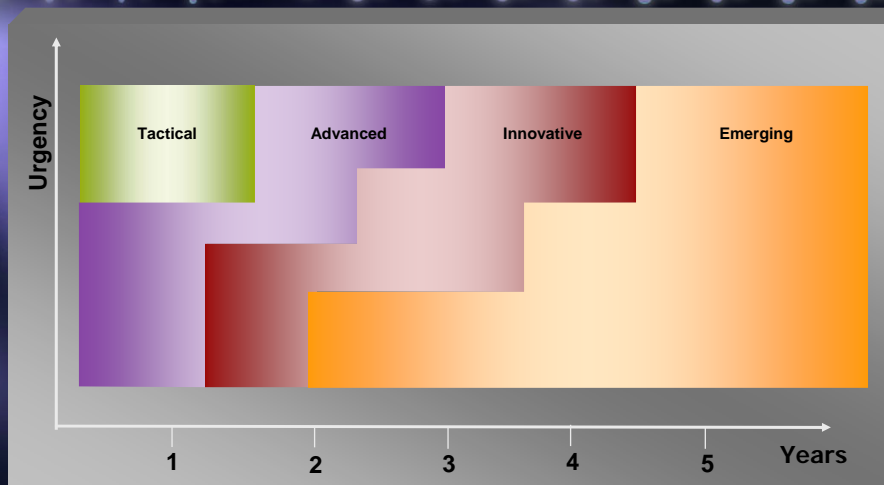
# Considerations For Future Technology Planning In Coordination With New Facility Design

## Change Drivers: Planning Considerations

- Rethink traditional notions
- Recognize increased dependence on technology and the imperative for full integration
- View technology as a whole, not in silos
- The design should facilitate integration

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## Change Drivers: Lifecycle



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## Change Drivers: Health Care Technology Trends

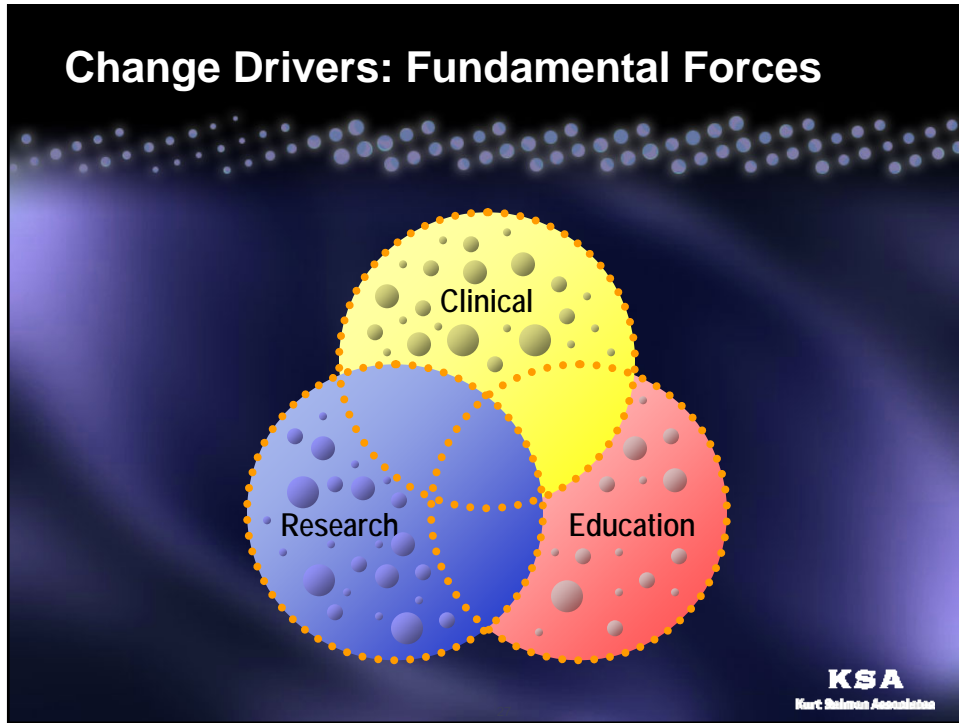
- **Explosion in devices in patient rooms**
  - Electronic Health Record access
  - Point of care interactions
  - Direct data acquisition from biomedical devices
  - Patient communication, entertainment and control
  - Video monitoring
- **Visitor and family needs**
  - Access to high-speed wireless and power sources
  - Internet-based video conferencing for “visits” with patients
- **Multi-function video systems**
  - Patient monitoring to improve visualization
  - Video conferencing between locations
  - Digital content and control
- **Building control systems**
  - Integration into enterprise network
  - Improved control for patients
  - Enhanced monitoring
- **RFID for tracking applications**
  - Active tags for tracking patients, staff, mobile assets
  - Passive tags for security, consumables

## Change Drivers: Health Care Technology Trends

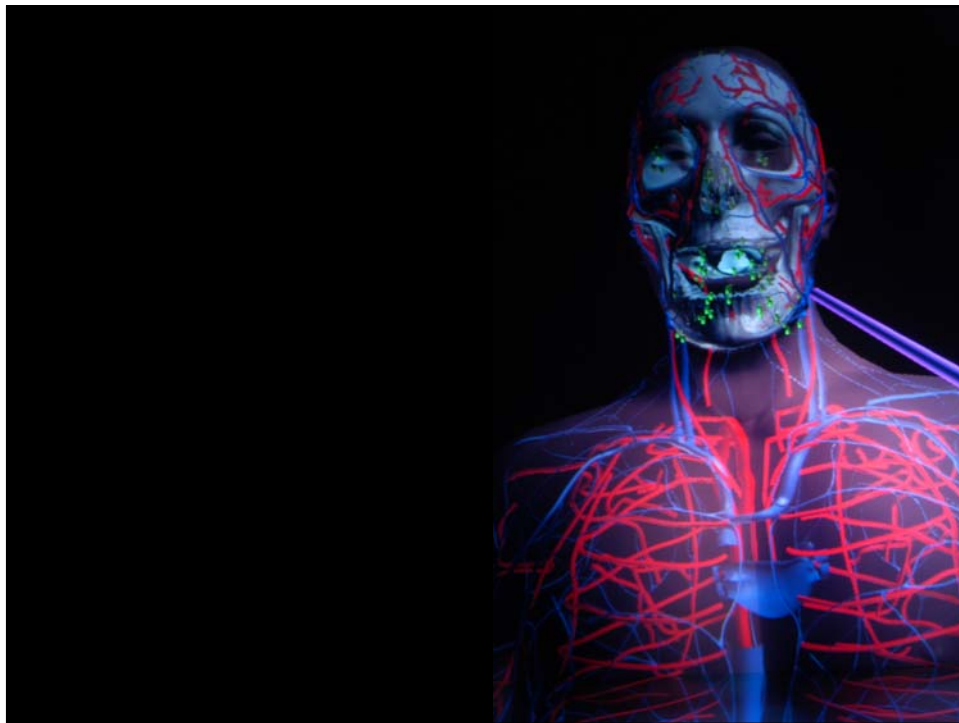
- **Convergence of networks – single enterprise network infrastructure**
- **Convergence of end user devices**
- **Simplification of user terminals**
- **Multi-function devices**
- **Equipment rooms**

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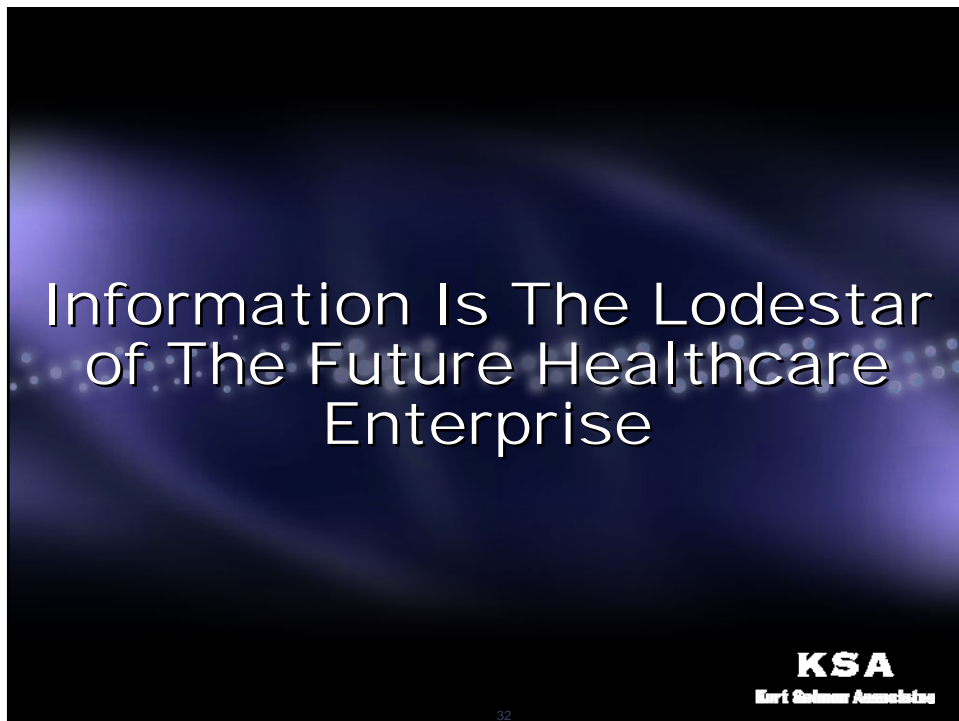
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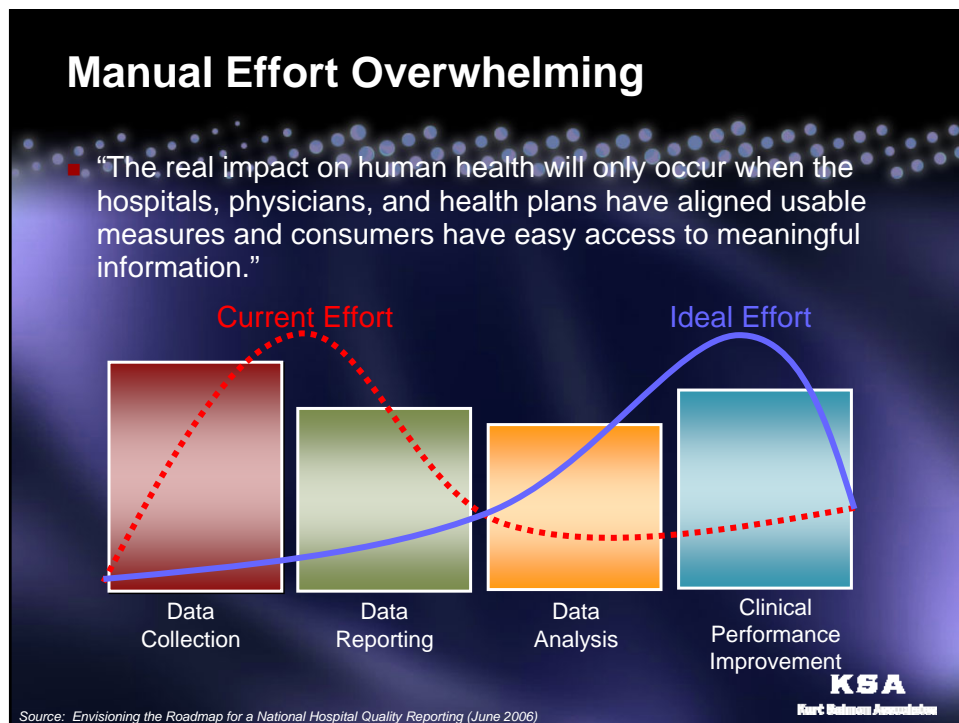
# Considerations For Future Technology Planning In Coordination With New Facility Design



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# Considerations For Future Technology Planning In Coordination With New Facility Design

## Quality Requires Consensus

- “The biggest challenge to realizing the vision of a national quality reporting system that enables hospitals and other care settings to **collect and transmit data once**, and have that data serve the diverse quality reporting requirements of all stakeholders, is gaining consensus on what to measure, when to measure, and how to report the results.”

Source: Envisioning the Roadmap for a National Hospital Quality Reporting (June 2006)

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## Evolutionary, not Revolutionary

- Technology, including EHRs, is **not a panacea** that will miraculously appear and solve the complexities of healthcare as a deus ex machina.
- Technology will continue to **evolve** over time to better meet the needs of clinicians, patients, payors, and government.
- **Trial and error** continue in the free market economy.
- Just like watching your children grow, **progress** will **only** be **evident** when **looking back** over a long time horizon.

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# Considerations For Future Technology Planning In Coordination With New Facility Design

## The Challenge of Planning For Future Technology

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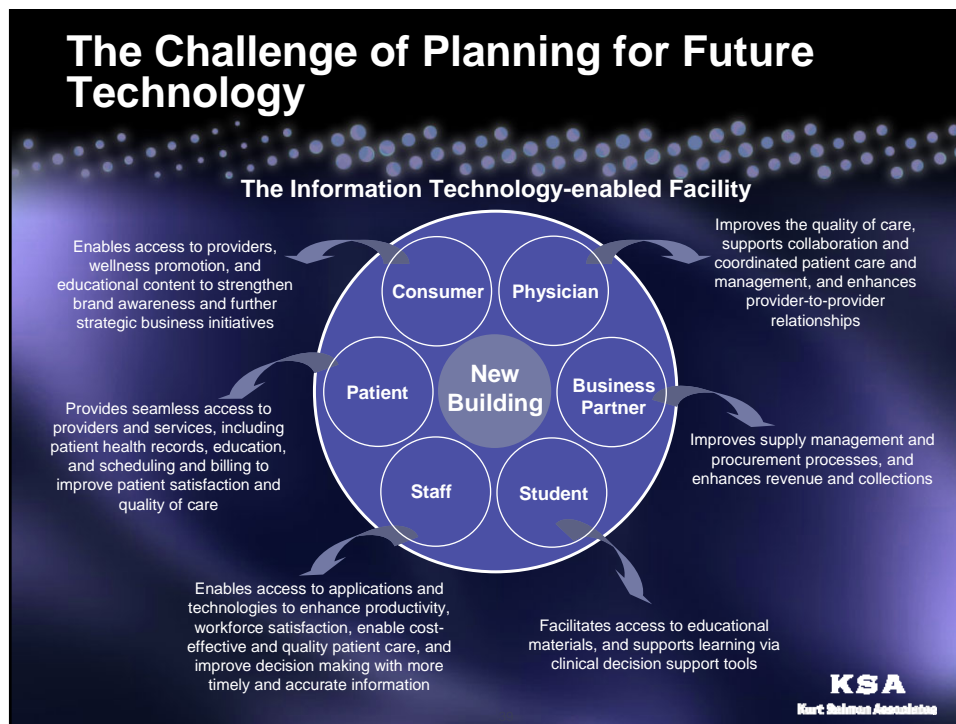
## The Challenge of Planning for Future Technology

Today and in the future, the technology infrastructure will be at least as important as the physical structure of the building in supporting the delivery of care.

- Care has never been delivered without technology; however, the reliance on technology has grown exponentially.
- Plan for the technology-rich clinical environment:
  - Create a platform not just for opening day, but to support the continued adoption of leading clinical and ancillary technologies for the life of the new building.
- New facilities must be designed with technology-enabled operations as a core building principle.
  - Integral to the planning process
  - Technology infrastructure is as fundamental as the structural support of the building
- Using technology to make the enterprise attractive to all constituencies:
  - The preferred care provider
  - Desirable for medical staff
  - Employer of choice for staff

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# Considerations For Future Technology Planning In Coordination With New Facility Design



## The Challenge of Planning for Future Technology

Planning for a new facility may require rethinking traditional notions to recognize the increased dependence on technology and the imperative for full integration.

- View technology as a whole, not in silos; including:
  - Information technology,
  - Telecommunications,
  - Clinical monitoring technologies,
  - Diagnostic and treatment technologies,
  - Biomedical engineering, and
  - Building systems.
- The design should facilitate integration:
  - Seamless information flows,
  - Within and external to the building,
  - Across systems, and
  - Single point of access to multiple systems.

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# Considerations For Future Technology Planning In Coordination With New Facility Design

## The Challenge of Planning for Future Technology

The CIO often is faced with a plethora of issues in promoting the inclusion of technology as critical to the initial planning.

- A subset of the many issues which face the CIO include:
  - How paperless and filmless? When? Phasing?
  - Timelines for major health care IT projects (e.g., full EMR) versus new facilities timelines.
  - Integration of biomedical and information technology infrastructures, equipment, and data handling.
  - Unifying IT, telecom, and clinical data transfers (e.g., computer, phones, nurse call, IV pumps, vital sign monitors, asset tracking, remote patients).
  - Clinician productivity devices, such as mobile computer, tablets, PDAs; convergence to single, multi-user devices for clinicians; use of voice and handwriting recognition.
  - Support for patient-safety and operational improvements.
  - Use of pervasive wireless as part of a single, robust network and connectivity infrastructure.
  - Inclusion of adequate learning and process-change time.
  - Retrofitting older facilities to support consistent clinical practice.
  - Adequate capital and operating resources for: getting there, maintaining it after opening day, and keeping technology current on an ongoing basis.

## The Challenge of Planning for Future Technology

The mantra of many institutions is to leverage technology to operate in a highly efficient and safe manner while delivering world class service to achieve competitive differentiation through technology.

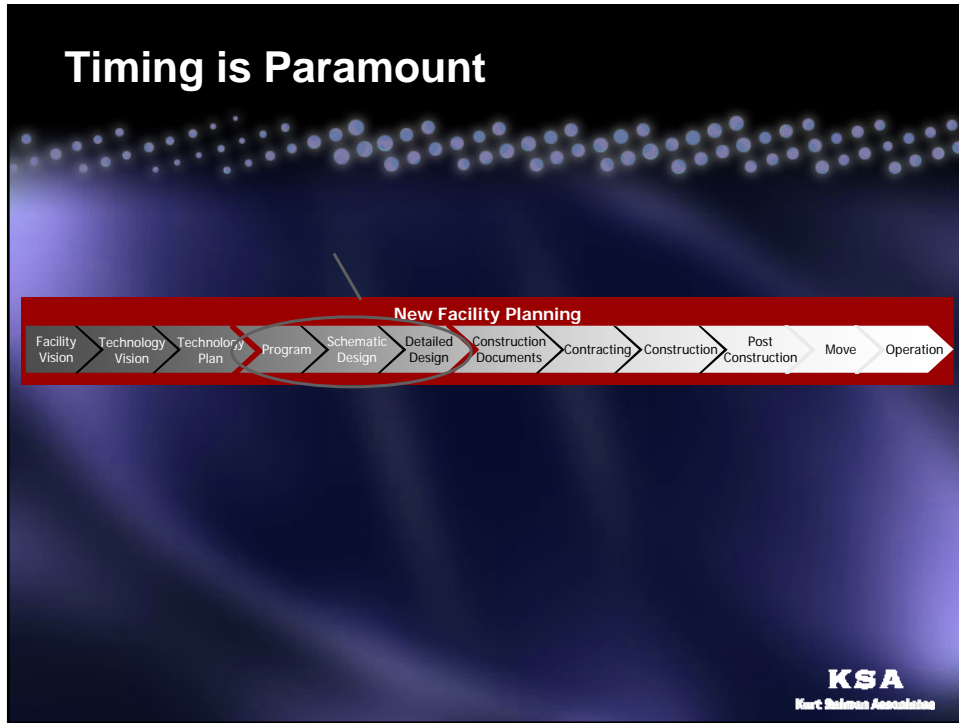
- Real time data available for management dashboards/decision making
- Automated data capture instead of manual recording – biometrics, barcode/RFID, telemetry, hemodynamics
- Highly integrated, easy to access information for the purpose of improving care and lowering costs
- Voice data entry – doctors' orders, notes/nursing documentation
- Wireless voice and data
- Telecommuting
- Smart buildings – building systems that communicate over the hospital's data network and integrate with its IT systems
- Implement as much new technology as possible in our current hospital before moving to our new facility

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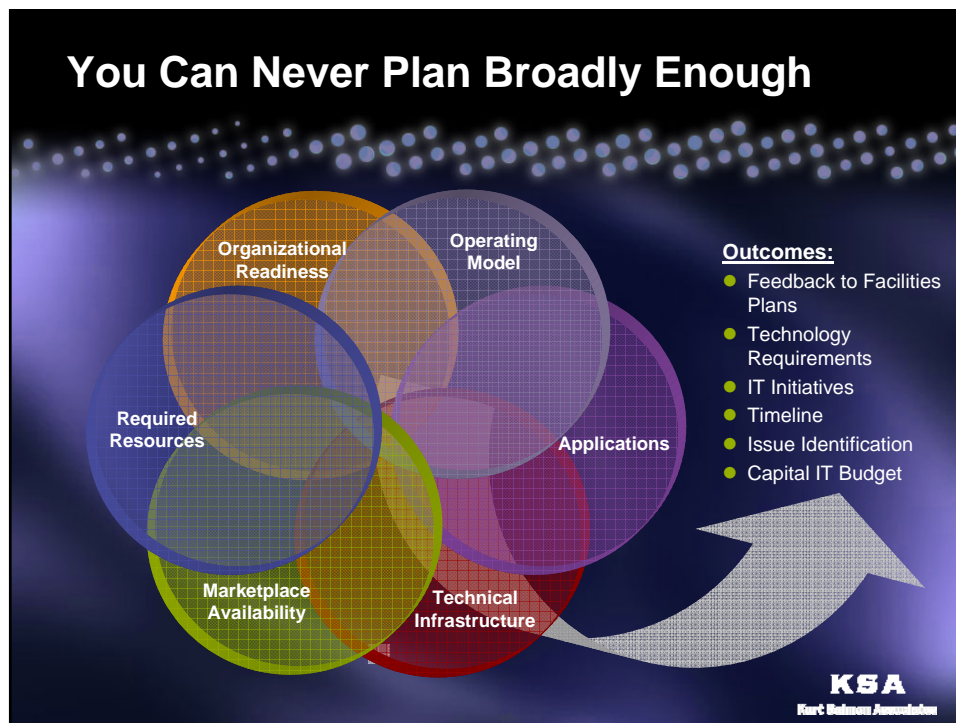
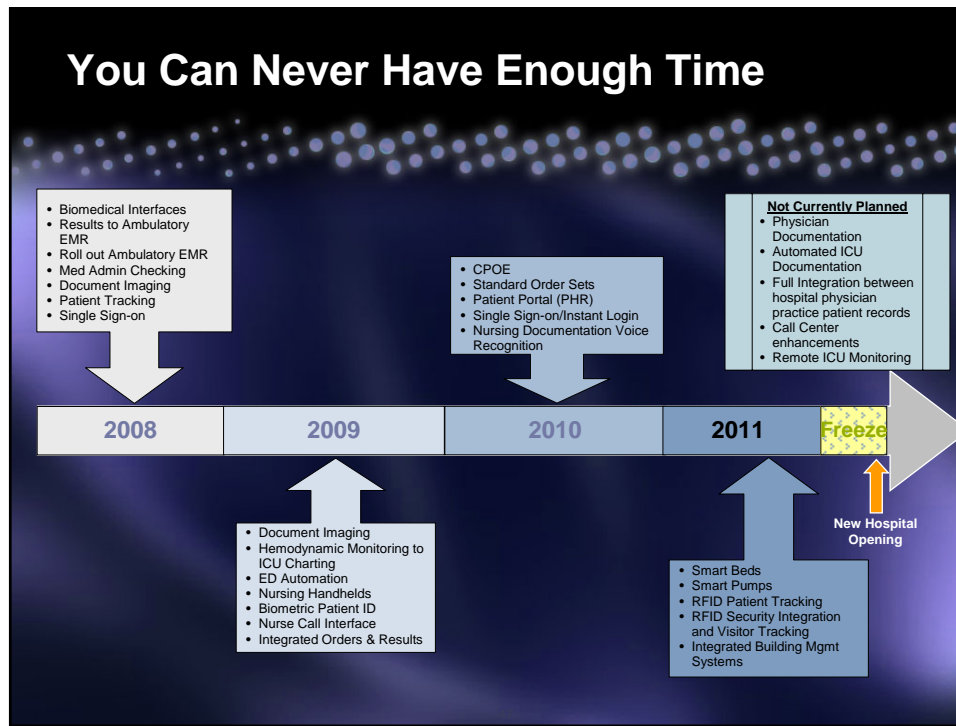
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## Assessing Readiness

<b>Organizational Culture &amp; Commitment</b>	<ul style="list-style-type: none"> <li>Organizational &amp; Departmental Leadership</li> <li>Project Sponsorship &amp; Ownership</li> </ul>	<ul style="list-style-type: none"> <li>Clear Project Goals &amp; Objectives</li> <li>Change Management</li> <li>Communication</li> </ul>
<b>User Participation &amp; Buy-In</b>	<ul style="list-style-type: none"> <li>Clinician/User Enthusiasm &amp; Support</li> <li>Willingness to Change Processes</li> </ul>	<ul style="list-style-type: none"> <li>Ability to Focus Attention on Project</li> <li>Ability to Mandate/Incentivize Use of Automation</li> </ul>
<b>Human &amp; Financial Resources</b>	<ul style="list-style-type: none"> <li>Resource Availability &amp; Commitment</li> <li>Presence/Availability of IS Support</li> </ul>	<ul style="list-style-type: none"> <li>Ability to Achieve Balance with Competing Initiatives</li> <li>Financial Resource Availability</li> </ul>
<b>Process Redesign</b>	<ul style="list-style-type: none"> <li>Acceptance of/Ability to Support Required Changes</li> <li>Presence of Supporting Policies</li> </ul>	<ul style="list-style-type: none"> <li>Willingness to Standardize</li> <li>Comfort with Technology</li> <li>Limited Clinical Overlap with Others</li> </ul>
<b>IT Environment &amp; Vendor Readiness</b>	<ul style="list-style-type: none"> <li>High Existing Automation Level</li> <li>Required Product/Functionality Available in Portfolio</li> </ul>	<ul style="list-style-type: none"> <li>Appropriate Implementation Timeline</li> <li>Availability of Integration</li> <li>Infrastructure Prerequisites in Place</li> </ul>

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# Considerations For Future Technology Planning In Coordination With New Facility Design

## Ready or Not . . .

A thorough assessment should be conducted to select the pilot site.

	Organizational Culture & Commitment	User Participation & Buy-In	Human & Financial Resources	Process Redesign	IT Environment & Vendor Readiness	Potential Pilot Sites
ED	Moderate-High	Moderate-High	Moderate	Moderate	Low-Moderate	Drop
ICU	High	High	Moderate-High	High	Moderate-High	Keep
CCU	High	High	Moderate-High	Moderate	Moderate-High	Consider
Acute Care	Low-Moderate	Moderate	Low-Moderate	Low-Moderate	Moderate	Drop
Oncology	Low	Low-Moderate	Moderate	Low-Moderate	Low-Moderate	Drop
Cardiology	High	High	Moderate	High	Moderate	Keep
Primary Care	High	High	Moderate	High	Moderate-High	Keep

## You Can Never Be Rich Enough

High-Level Information Technology Infrastructure Budget	
Category	Estimate
Network	\$23,102,000
Patient Entertainment/Console	\$2,932,000
Telecommunications	\$8,910,000
RFID	\$3,180,000
Workstations & Devices	\$8,280,000
Displays, Kiosks & Way-finding	\$1,720,000
<b>TOTAL CAPITAL</b>	<b>\$48,124,000</b>
Annual Lifecycle Replacement	\$12 million
Annual Support	\$8 million

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# Considerations For Future Technology Planning In Coordination With New Facility Design

## You Can Never Have Enough Friends

- Active physician leadership and participation is critical
- Buy-in from all levels of the organization is essential
- Appropriate expectation setting and communication
- Critical mass of IT utilization
- Linking formal IT oversight/governance process with new facility planning
- Willingness and/or ability to enforce standards
- Appropriate funding for IT initiatives separate from the construction budget
- Availability of IT resources may be a limiting factor

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## You Can Never Be Confident Enough

- Are you committed to making the culture and process changes required to achieve the vision?
- Do you have champions in the clinical and administrative leadership?
- Does the organization have the resources and wherewithal to acquire/implement the necessary technologies?
- What are the major barriers to achieving the technology milestones underlying achievement of the vision for the new integrated health campus?
- What is realistic to accomplish before the opening of the new hospital?
- How long should your freeze zone be?

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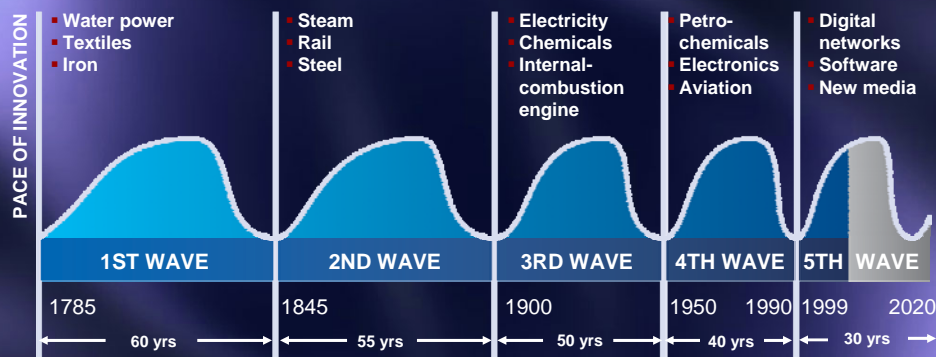
# Considerations For Future Technology Planning In Coordination With New Facility Design

## KSA Services for Future Technology Planning

KSA has extensive experience supporting clients in their facility-related IT visioning and planning efforts.

- Among the services we have provided to clients:
  - **Technology visioning.** Development of a holistic vision of technology, encompassing a fully integrated technology environment of clinical, administrative, communication/connectivity, and information technology.
  - **Key assumptions.** Documentation and elaboration of key technology assumptions underlying facilities design to assure congruency of building capabilities with organizational goals and expectations; and with IT plans.
  - **Budget review.** Review of new facilities technology budgets to assess adequacy, identify key gaps, and congruence with organization goals and expectations.
  - **Consistency.** Documentation and validation of the link between the underlying operation assumptions and the technology plans.
  - **Gap analysis.** Identification of significant gaps between necessary capabilities and the technology vision.
  - **Prioritization and phasing.** Assisting clients in prioritizing the acquisition of infrastructure capabilities within the available budget so that the opening day and subsequent years' capabilities are in place as needed to support the operational requirements.
  - **Integrated planning.** Integrated technology planning as part of a formal facilities master plan development and functional and space programming.
  - **Educating management.** Creation of a statement of purpose suitable for Senior Management that links the broader operational requirements with the technology infrastructure capabilities provided in the technology budget.

## Parting thought: Cycles of Innovation



Source: Economist, 1999

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# Considerations For Future Technology Planning In Coordination With New Facility Design

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